Selling the United States Short

THE volume of general business in the United States is consistently greater than at any other period in its history. The prosperity in the United States as a result of generally sound business conditions, is better than at any other previous era in its history. In spite of these facts we have seeming contradiction arising from the complaints regarding business from a pessimistic class of business men.

What is the matter with general business? Nothing! The volume of general business is breaking all records, but the business world needs to discriminate between business sentiment and general business. There is an opportunity for wide discrimination between these two factors.

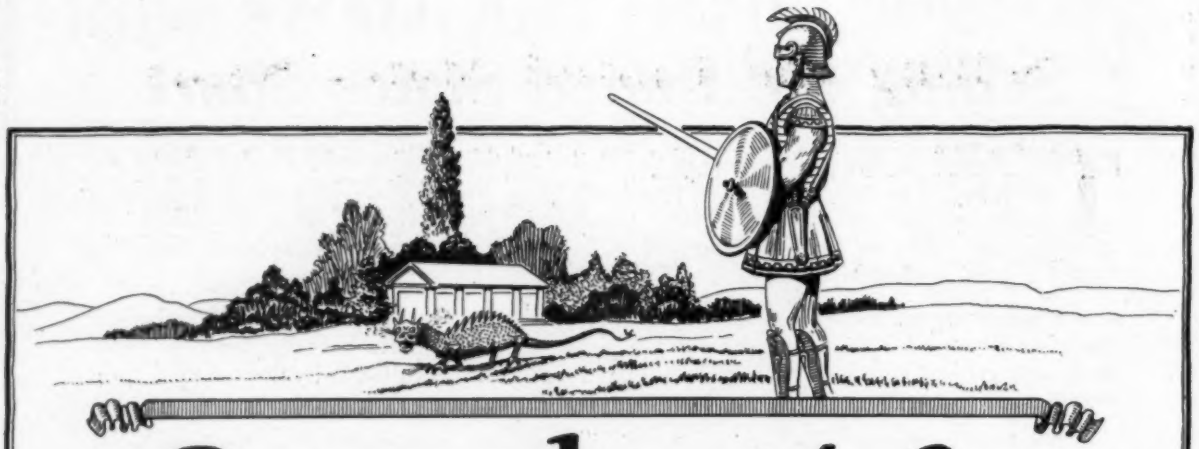
What is the matter with business? Wrong business sentiment. The business sentiment of today is shot through with uncertainty and hesitancy. It is wrong where general business is good, and as between these two factors in business, the facts of general business will prevail and business sentiment will have to swing into line. Business sentiment is affected by external happenings. Probably the one big happening that turned business sentiment pessimistic has been the fluctuation in the stock market this year. However, the stock market, our business men are finding out and our leading economic experts are clearly pointing out, is no barometer of trade. This ought to be made very plain because the prices of stocks, rise or decline, does not necessarily mean that the cost of commodities will rise or decline in conformity with the rise and fall of stock market prices. The fact is that when stock market prices fell and continued weak, the prices of commodities remained strong and went higher. This is often the case, and this accounts for the mental friction that we find among business men today.

However, with the unprecedented record of business success being published weekly, business sentiment is changing rapidly from pessimism to optimism.

Car loadings for the week ending May 29th are the most extraordinary for this period of the year. 1,081,000 cars were loaded, an increase of 168,000 cars over the loadings of the same week in 1925. We searched the records carefully for a similar increase in a week's loading of revenue freight cars, but in vain. It is record-breaking, tremendous, and almost inconceivable that the volume of general business should continue to constantly rise to these unprecedented figures. It reflects indubitably the sound condition of absorption of commodities by the consumers of the United States. It also reflects the paucity of stocks held by wholesalers, retailers and consumers. Furthermore, it is a guarantee of the increasing absorption of commodities. It is not car loading alone. The absorption of commodities by the consumers in this country is further guaranteed by the enormous amount of checks drawn in payment for same, as shown by the bank clearances. They are running from 7 to 17 per cent above that of a year ago. Why, then should business men hesitate and why should business sentiment close its eyes to the reassuring facts of the sound business future that is ahead of all departments of commerce and industry in this country?

"Don't sell the U. S. short" was the advice given by the elder Morgan to his son. It is the soundest piece of advice ever enunciated by a father to a son in this country.

117,000,000 of the richest, most intelligent and discriminating purchasers in the world, enjoying the highest standard of living known on earth, whose earnings and income exceed that of any group of people in the world's history, is the underlying basis for the prosperity of the United States. This great army of home consumers, rich, aggressive, and restless, demand good goods at good prices, as the facts and statistics of general business amply prove. 1926 so far has been more profitable and has enjoyed better business than the same period in 1925. The balance of 1926 will eclipse the last six months of 1925. Keep your chin up!



Searching for the Golden Fleece

Albany Felts

The Papermakers' Golden Fleece

Jason, the nephew of King Pelias, was sent in quest of a wonderful Golden Fleece kept in a sacred grove and guarded by a dragon. Jason, after many struggles, secured the beautiful Golden Fleece.

Our wool buyers search the wool markets of the world to secure the choicest fleeces from healthy sheep. In making Albany Felts and Jackets we use wool from Australia, New Zealand, South Africa, England, Canada and North and South America.

The blending of these wools calls for exacting skill. Often six or seven different wools are used to make a felt best suited to the machine speed, weight of paper, kind of stock used and finish desired.

Perhaps you are experiencing difficulties with felts which we can help you remedy. The benefit of our many years experience has been valuable to some of the largest mills. It will be valuable to you. We'll gladly prove this.

ALBANY FELTS

Woven from the World's Choicest Wools

ALBANY FELT COMPANY Albany, N.Y. U.S.A.

Observations of a Traveler

A Visit to the Mead Plant at Kingsport, Tenn.

AT THE close of the spring meeting of the Southeastern Division of the American Pulp and Paper Mill Superintendents' Association, the representative of The Paper Industry accepted an invitation to visit the pulp and paper plant of the Mead Fibre Company at Kingsport, Tenn. The trip was made by motor car from Asheville, N. C., over the Blue Ridge mountains to Johnson City, Tenn., from which it is only a short drive to Kingsport. March was turning into April when we started and many of the mountain tops were still covered with snow, the ditches in the mountain passes being frozen over. The sun shone brightly, however, and rare glimpses of Mt. Mitchell and Mt. Pisgah were obtained en route, along with other mountain scenery and great stretches of hill and dale.

Kingsport has good hotel accommodations at the Kingsport Inn. It is a rapidly growing industrial center and besides the plant of the Mead Fibre Company, it is the home of the Kingsport Press, a large printing establishment which is now turning out 90,000 stitched cloth-bound books every working day; capacity of the plant is 100,000 books, and there is talk of enlarging it. It is noteworthy that the Mead Fibre Company and the Kingsport Press working in combination can manufacture the wood as it comes from the car into pulp, into paper and finally into finished books within the space of twenty-four hours. Kingsport is probably the only town in the United States where this striking transformation can be effected.

The resident vice president and general manager of the Mead Fibre Company at Kingsport is John H. Thickens, who is assisted by George C. McNaughton and W. H. Teter, G. S. Hamm being technical director, in charge of the chemical laboratory and testing department. It is one of the group of mills of the Mead Pulp and Paper Company, of which George H. Mead is president, and it has been in operation since May, 1917. Both Mr. Thickens and Mr. McNaughton were at one time connected with the United States Forest Service at the laboratories in Wausau and Madison, Wis. At the Mead Fibre Company's mill wood is cooked by the soda process to the extent of 95 tons a day, several different kinds of wood being used, such as gums (red and black), cotton, maple, willow, cucumber, lynn and poplar. In the recovery process for black liquor, two triple-effect Yaryan evaporators and one triple-effect Zaremba evaporator are used, together with four 9x20-foot rotary incinerators and two batteries of leaching cells, each containing five 7-foot units.

The Bellmer system is used for bleaching, and the pulp as it comes from the bleachers is washed in a Lancaster washer, made by the Thompson Manufacturing Company, of Lancaster, N. H. The Fourdrinier book-paper machine of 140-inch face is driven by rope and engine. The equipment includes two E. D. Jones & Sons Company Jordan engines and two Bird screens. The beaters are of the Niagara type manufactured by the Valley Iron Works Company. The daily production of paper is 35 tons and about a third of this output is consumed by the Kingsport Press, the remainder, as well as the surplus pulp, being disposed of through the Mead Sales Company.

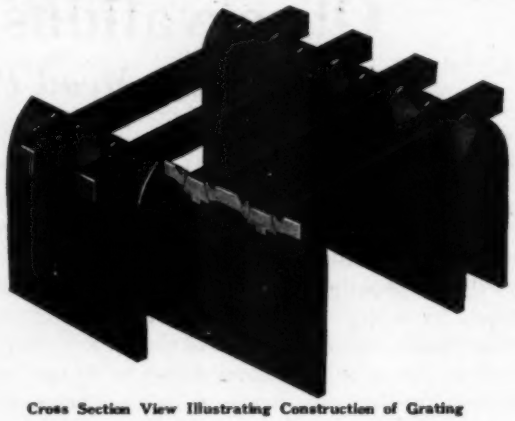
Many evidences of expansion and progressive development were noted. It is planned to erect an electrolytic plant for the production of chlorine and caustic soda. Some of the necessary equipment has already been assembled pending actual construction. There is also talk of installing an additional paper machine and preparations are being made to erect a large storage warehouse to house the raw materials, in addition to soda pulp used in the paper mill.

The power plant has been improved in a number of ways. One novelty is a General Electric Company turbo-generator with a rating of 2,500 Kva. which has been in operation since last July and has effected a great saving in steam consumption. Steam is extracted at 30-pound pressure from the eighth stage. This steam is used in the drying of pulp, as well as for running the multiple-effect evaporators and in providing the steam requirements of the caustic plant and bleach room. When the turbine is operated at maximum pressure a very low steam consumption per kw. hour results. On account of low pressure steam demands being so high in a soda mill, quite remarkable economies are reported as a consequence of this addition to the electrical power station. Indeed, the engineers calculate that the initial investment of $100,000 will pay for itself in one year.

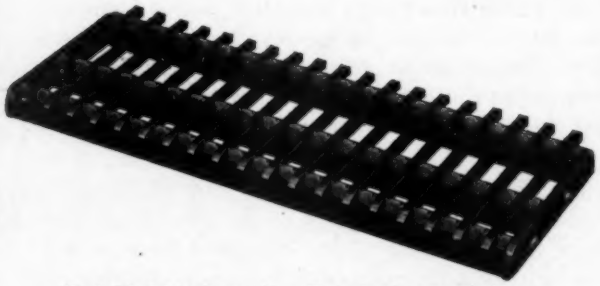
The operation of the paper machine room, as indeed all departments of the mill, is made highly efficient by the use of all the latest mechanical improvements, including Vickery doctors on dryers, besides the cleaning attachment for felts known as the Vickery felt conditioner. A Sturtevant vapor absorption system adds to the drying capacity of the dryers and prevents vapors.

Although a comparatively small plant, the Mead Fibre Company's mill boasts of a first-aid hospital and complete equipment.

View Showing Installation of M. & M. Safety Grating



Cross Section View Illustrating Construction of Grating



M. & M. Safety Steps. Note Their Sturdy Construction

M. & M. SAFETY GRATING

In M. & M. gratings an absolutely non-slip surface is obtained by having the ridges of the carrying members raised slightly above the general level of the mat, which has a tread surface of 3/8" square mat bars in two patterns:—"Close Mat," spaced at 1 1/8" centers, and "Open Mat," spaced at 1 1/2" centers.

The bearers, shaped thus: ⌒ run lengthwise of the gratings, at right angles to the mat bars, and are spaced at intervals of three inches to seven inches, according to requirements. They are one inch wide invariably and one and three-eighths inches deep for short spans, increasing to two and three-eighths inches, and to two and seven-eighths inches for longer spans and heavier loadings.

These bearers support the load to be carried and act as spacers for the mat bars with which they are firmly interlocked at intersections.

M. & M. gratings are made with special machines and tools specially designed for the purpose and under modern factory methods, that insure a *Uniform Product* of high standard, permit *Quantity Production* and *Quick Service*, and that also permit the sale of a vastly superior product at less price to the consumer than is generally demanded for the old bar-on-edge type of grating, built by the old cut-and-try hand labor methods.

M. & M. gratings can be made in units of any size desired up to a width of four feet, and up to a length of twelve feet; can be adapted to take care of any span and loading, and be designed to meet any special conditions.

M. & M. gratings are cross-locked by powerful presses and have a permanently non-slip surface. They will not become loose or rattle.

For *Balconies in Mills, Factories* and *Power Plants*, for covering *Manholes, Trenches* and *Sidewalk Areas*, for *Fire Escapes* or for *Any Situation* that demands a grating that can be walked on with safety.

M. & M. Safety Steps

Provide a safe, sure and comfortable foothold under all conditions.

Do not become loose or rattle, nor do they deflect under a concentrated load.

Are clean and sanitary and transmit light and air better than do grating treads of any other type.

CATALOG SENT UPON REQUEST

Write for Names of Paper Manufacturers Who Are Using M. & M. Gratings and for Sample Showing Tread Surface and Interlock

McGREGOR & McINTYRE, Limited
STRUCTURAL STEEL AND ORNAMENTAL IRON WORKS
1139 Shaw Street, Toronto, Canada

The Safety Contest

WHEN the purpose for which we carry out one idea and the other seems to be carrying forward the banner of success, it is always a cause for rejoicing and the expression of gratitude.

The background or motive in the offer by The Paper Industry to donate a silver loving cup to the paper or pulp mill member of the National Safety Council making the best accident record for the first six months of this year, aside from rewarding the successful contestant, was the encouragement to the paper industry as a whole to operate continuously over a fairly long period of time with a minimum of lost time accidents. The belief was and is that such efforts will do much toward establishing a habit of "Always Be Careful" in the minds of our workers.

Our hopes are being realized, for in the four months to May first, never fewer than fifteen mills have submitted perfect accident records for any one month.

In the June news letter to the members of the Paper and Pulp Section of the National Safety Council, Secretary Ameil Umberham writes as follows:

"Of the sixty-five mills reporting for the month of April, fifteen were perfect; sixteen were perfect in March; fifteen in February and twenty-one in January.

"The following four mills have perfect records up to May first: Robertson Paper Company, Adams Bag Company, Upson Board Mill and the Neenah mill of the Kimberly Clark Company.

"The first twenty-two mills in the contest are all under a severity rate of .200, which means, according to the Nationanl Safety Council, that 'any one of these still has an excellent chance to win the cup.'

"Some truly remarkable records are being piled up by some of the large mills. The mill standing 12th in rank has over 1,300 employees. The mill standing in 13th place is also a whaling big organization. Fourteenth in standing is a notable contender. The Nekoosa-Edwards Paper Company, prize winner of the August, 1925, contest, is making a wonderful scrap this year.

"The dope on the prospects of small mills as against large mills is that while the small mill has fewer men to keep in line for a perfect record, an accident counts with greater severity when it does come."

It will be remembered that an essential point brought out at the beginning of the contest is that in the event of two or more mills being tied at the end of six months, the contest will continue until the tie is broken.

Mr. Umberham has reminded members of the Paper and Pulp Section that before the cup can be awarded this year, no matter how clear may seem to be the title to it, all statistics must be reviewed by the Executive Committee of the Pulp and Paper Section and a meeting of this committee will be held on Monday noon of Congress week at Detroit for the purpose of passing upon the cup award.

Quoting further from Mr. Umberham's letter, he gives the following as samples of problems to be met in passing upon the cup award:

"1. What shall be the status of the mills who delay reports?

"2. With a close decision probable, 20 mills at present being under the .200 severity classification, shall the Executive Committee, as in the case of the Petroleum Contest, call for mill reports on all injuries within plants that lead the contest? In other words, to make the title of the winning mill eminently clear before the world, shall the Executive Committee pass upon the credibility of the figures themselves.

"3. Several mills, unwilling to decide certain accidents for themselves, are submitting them to the Executive Committee, resting the case upon unbiased judgment.

"4. Accidents on new construction work are the stumbling-block in all paper mills. Some mills are reporting their construction accidents under protest, arguing that they are not bona fide paper mill accidents. Some are withholding the figures, as not included in the contest. Others, probably the majority of the contestants, are reporting construction accidents without parley.

"The chairman, in the hope of keeping the contest sweet until the end, would like to remind members of the Section that construction accidents are a real burden to the National Safety Council as a whole. All this year the Construction Section has been making desperate pleas for assistance. In the light of this major anxiety, every section in the council doing construction work at home ought to assume the liability.

"Does the Wisconsin rule throw light on the matter? A mill is exempt from accident liability when construction work is in the hands of an insured contractor. Conversely, a mill is liable for all accidents on construction work done on its own time and payroll and covered by its own insurance."

Secretary Umberham has informed the members of the Section that although all contestants in the present Paper Industry Safety Contest have been notified several times, there are still some who do not get their report in on time. Therefore, he announces that hereafter contestants more than thirty days late in submitting their monthly report will automatically be withdrawn from the contest.

We sincerely hope that no mill who has entered this contest will suffer their name to be withdrawn.

How Much Money Is *Lost* in Your Mill in White Water?

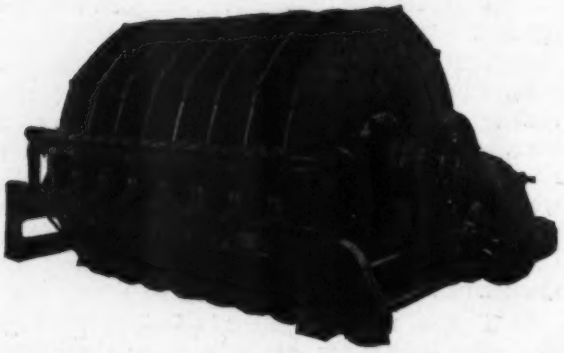


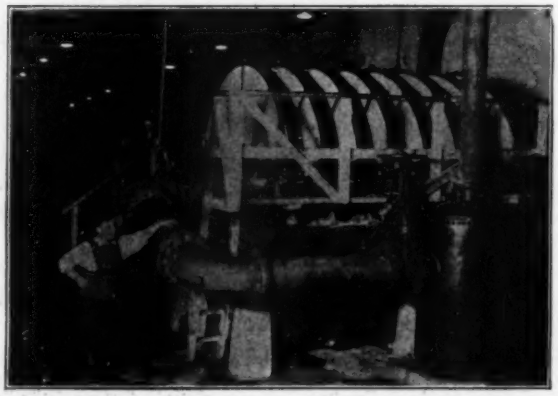
Figure the answer to that question for the entire Paper Industry and it mounts into the millions every year.

In the past, all a mill could do was to let the fiber the paper mill machinery overlooked run to sewer—a liability. Now, a further and practically a complete saving of pulp from white water can be made—with the American Continuous Filter.

Here, paper machine white water loaded with valuable stock passes through slowly revolving filter screen discs. Pulp forms on the screen—pulp laden white water is drawn through that pulp—matted fiber holds back fiber, and allows only clear, clean water to pass out of the American Continuous Filter—to be re-used in machine showers or elsewhere.

Write for more information on this waste eliminator. The American Continuous Filter can be used for different purposes. It thickens groundwood or chemical pulp—it recovers fiber from white water—it effectively handles the final washing of soda and sulphite pulp and filters and washes lime mud.

Any one of our nearest offices will not only recommend the proper type of American Filter best suited to your flow sheet, but will demonstrate the effectiveness of the machine in your own mill on your own white water with a small portable outfit, if desired.



Pulp Type American Continuous Filter operating in a Paper Mill. Furnished in sizes containing 1 to 10 Discs and capacities ranging from 250 to 6,000 gallons per minute.

American Continuous Filters
Sweetland and Kelly Pressure Filters

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THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

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Effecting Economies in Boiler Room

Suggestions Resulting from Inspection of Twenty-One Paper Mill Power Plants

By ANDREW F. SHEEHAN

THE writer has within a recent period visited twenty-five paper mills in the different sections of Massachusetts and made careful note of their power plant equipment. Twenty-one of these mills furnished their own power with steam engines and the remaining four, which were the smallest of the lot, purchased electric current at prices ranging from one-and-one-eighth cent to two cents per kilowatt hour.

The twenty-one mills generating their own power will be the subject of this discussion, their power costs analyzed and a few suggestions made with a view to showing how to effect large reductions in fuel cost and how to bring the plants to an economical power producing basis at a reasonable outlay of capital.

General Description of Plants Visited

The plants all used four-valve engines, either Corliss, Greene or Fitchburg type; all of them ran their main engines condensing and were about equally divided between using single cylinder units and compound engines. The machine engines were mostly of the single cylinder, slide-valve type exhausting into the dryers at pressures from 5 lb. to 20 lb. Two mills, however, had four-valve Corliss engines on the paper machines. It was noted that with slide-valve engines, there was frequently an excess of exhaust steam which had to be relieved to the atmosphere, whereas with Corliss engine drive, the exhaust seldom exceeded the requirements of the dryers. In some of the mills, live steam was also used to supplement exhaust steam in the dryers. In the mills where single cylinder engines were used, the power required to run the mill averaged 525 h.p. in ten plants. In the eleven mills having compound engines, the power averaged 1,000 h.p. including the machine room. Mills of the latter type usually had three machines, and in the former class two machines prevailed. The average steam pressure in the twenty-one mills was 130 lb. The water rate of the compound engines at 130 lb. pressure and 26″ vacuum will average 14.5 lb. per h.p. hour and 18.5 for the single cylinder condensing engines. The slide-valve engines, all of the throttle governing type must have had a water rate of 45 lb. per h.p. at 5 lb. back pressure and 55 lb. at 20 lb. back pressure. The average power required to run paper machines was 63 h.p. in the twenty-one mills.

When Remodeling Is Justified

Naturally, the small mills would not want to spend as much money to remodel their plants as the larger mills, but in view of the high rate of interest that the fuel saved would earn on the invested capital, considerable expenditure is justified. If the boilers in the mills having single cylinder engines can carry a pressure of 130 lb. and are in good condition, we will not propose any change in the boiler plant.

The fuel consumption averaged 22 tons per day with an average of 525 h.p. developed. Average evaporation being 8 lb., the load on boilers was 14,666 lb. per hour. With 126 h.p. developed in the machine room (two-machine mill, 63 h.p. each) at an average steam rate of 50 lb. per h.p. hour, then 6,300 lb. of steam per hour was used by the machine engines and dryers. No live steam was charged to dryers when driven by slide-valve engines, as there usually was more than enough exhaust to dry paper. The main engine then developed 525-126, or 399 h.p., and with a water rate of 18.5 lb. per h.p., would use 7,381 lb. of steam per hour—14,666—(7,381 + 6,300), leaves 985 lb. of steam per hour which was used by the

boiler-feed pump, condenser pump and steam traps draining condensation from live steam lines.

A Fuel Saving Plan

The following plan will show a fuel saving of 30 per cent over present performance and nothing is suggested which has not stood the test of every-day operating conditions in other plants, outside the paper industry.

The engines on paper machines to be replaced by motors and a uniflow engine should be installed to carry the additional load which would be put on the main drive by this change. A superheater should be installed to reduce cylinder losses in main engines. With motor drive on paper machines the plant would operate as follows:

The 6,300 lb. of steam formerly used by the machine room is to be passed through the main engine and then exhausted at a few pounds back pressure into the dryers. The water rate of the main engine, with steam superheated 100° F. and running non-condensing, will be around 21 lb. per h.p. hour and using 6,300 lb. of steam will develop 300 h.p. This leaves 225 h.p. to be generated by the uniflow engine which will run condensing and whose water rate will be 13 lb. per h.p. hour, with steam at 130 lb. pressure, 100° F. superheat and 26″ vacuum. The total steam flow to the uniflow engine will be 2,925 lb. of steam per hour.

The steam consumption of the condenser pump will be greatly reduced since it will have to condense less than half as much steam as formerly, 6,300 lb. of steam for the four-valve engine, 2,925 for the uniflow and 500 lb. per hour for the condenser and feed pumps, bringing the total steam flow up to 9,725 lb. per hour. This is a reduction of 33.7 per cent in steam consumption which will amount to 30 per cent fuel saving after allowing for the fuel required to superheat the steam. There will also be a saving due to slightly higher feed temperature since the feed formerly consisted of 6,300 lb. of condensate from paper machines at about 230° F. and 8,366 lb. of make-up water at 100° F. Now the feed will be 6,300 lb. of condensate at 230° F. and only 3,425 lb. of make-up water at 100° F., giving a higher temperature in the mixing tank and consequently a higher temperature leaving heater. With 6,300 lb. at 230° and 8,366 lb. at 100° the average temperature is 155°, and with only 3,425 lb. at 100° mixing with 6,300 at 230° the average temperature is 184°.

The average fuel cost in this locality is $7.00 per ton and the former fuel consumption of 22 tons daily 304 days a year brought the fuel bill to $46,816 a year. A 30 per cent saving amounts to $14,044, from which we must deduct the fixed charges on the uniflow engine, superheater and motors. The uniflow engine of 225 h.p. and a 150 k.w generator could be installed for $70 per k.w. or $10,500 for the unit complete. The motors with a combined capacity of 126 h.p. could be installed for $2,000 and a superheater with a capacity of 9,725 lb. of steam per hour could be erected for $4,500. Allowing 12 per cent for interest, depreciation and maintenance, the fixed charges come to $2,040 per year and the net reduction in power costs is $14,044 minus $2,040, or $12,004 per year. Since the total investment is only $17,000 the reduction in costs is equivalent to a dividend of 70.6 per cent on the money expended.

Reduction in Labor Costs

There would also be considerable reduction in labor costs in the boiler room. In plants of this class, there are usually employed three firemen at $1,700 a year each, three firemen's helpers at $1,300 a year each, and three coal and ash handlers who also do boiler cleaning at $1,300 a year each. Now since the load on the boilers is reduced by about one-third, that means one-third fewer boilers to operate and one-third less coal and ash to handle, so one fireman's helper and one coal and ash handler could be dispensed with at a saving of $2,600 a year. The labor saving alone would more than suffice to pay the overhead on the new equipment and the total saving a year amounts to nearly the entire sum invested.

Of course, many mill owners will insist that this saving would be much less if the plant had to operate at half capacity owing to slack business conditions. But with a gross saving of $14,044 in fuel costs and $2,600 in labor costs, the saving would pay the fixed charges even if the plant only ran a month and a half during a dull year, since the gross saving is $1,387 monthly. Even operating at one-fourth capacity for a year, the saving will return a good rate of interest on the money invested. Also the approximate cost per k.w. hour in the plant will be (assuming 525 h.p. to be equivalent to 390 k.w.) less than three-quarters of a cent, charging $6,300 a year as engineer wages, one-third the fuel bill of $32,772 and one-third the total boiler room labor, $10,300, and $2,000 fixed charges. A total of 2,808,000 k.w. hours per year can be generated for $10,924 (coal) + $6,300 (engineer's wages) + $3,433 (boiler room wages). Balance of fuel and labor costs must be charged to drying paper.

Remodeling Plan for Larger Mills

In the larger mills a more elaborate plan of remodeling could be carried out. With a total of 1,000 h.p. developed, the machine engines (three of 63 h.p. each) developed 189 h.p. and 811 h.p. was generated by the main engine. At 14.5 lb. per h.p. hour, the steam flow to the main unit is 11,759 lb. Steam consumed in machine room at 50 lb. per h.p. hour is 9,450 lb. per hour. About 800 lb. per hour is used by feed pump and condenser. The average fuel consumption in three-machine mills was 31 tons per day and with a total steam flow of (11,759 + 9,450 + 800) or 22,009 lb., the average evaporation is 8.52 lb. of water per lb. of coal.

By starting to improve the boiler plant, labor costs

as well as fuel costs can be reduced. With an average steam pressure of only 130 lb., the steam rate of the compound engines is higher than if we had a boiler pressure of 200 lb. with 150° of superheat. But probably the present high pressure cylinder of the engine would not stand a pressure or a temperature such as is proposed. Obviously, if we increase the pressure to 200 lb. and use 150° superheat we must replace the high pressure and temperature. Also we will replace the machine engines with motors and generate all power with the main engine. Steam at low pressure for drying the paper will be extracted from the exhaust of the high pressure cylinder and the remainder of the steam will pass into the low pressure cylinder. Since the dryers require 9,450 lb. of steam per hour, this amount of steam passed through the high pressure cylinder and expanded to 15 lb. will develop 610 h.p. (Water rate for h.p. cylinder alone 15.5 lb. per h.p. with 200 lb. and 150° superheat). Now 390 h.p. more must be developed and all steam over and above 9,450 lb. will work through both cylinders and expand to 27″ vacuum. The water rate of a compound condensing engine working between 200 lb. and 27″ vacuum with 150° superheat can be brought down to 10 lb. per h.p.; consequently, 10×390 or 3,900 lb. of steam in addition to the extracted steam must be supplied. Steam consumption of feed and condenser pumps will now be only 400 lb. per hour and total steam consumption is 13,750 lb. per hour. This is a reduction of 37.5 per cent in steam consumption and $\frac{8259}{8.52} \times 24 \times 300 \times \frac{\$7.00}{2,000} =$ $24,427, the annual fuel saving. To generate 13,750 lb. of steam per hour will require 450 boiler horsepower and two boilers of 225 h.p. each could be installed. With underfeed stoker, one boiler could carry the entire load at 200 per cent rating if it became necessary to take one off the line for cleaning or repairs. The labor cost in this boiler room which employs usually four firemen at $1,700 each, three helpers at $1,300 each, three coal and ash handlers at $1,300 each, could then be reduced by $5,600 by eliminating one fireman, two helpers and one coal and ash handler.

The cost of boiler plant installed in the old building would be $65 per h.p. including stokers and superheater and would amount to $29,250; and a new cylinder for the engine to develop 610 h.p. would cost $15,000, $6,000 for three 63 h.p. motors and one 150 k.w. generator. Allowing 12.5 per cent fixed charges on the investment, the net saving will be as follows ($24,427 + $5,600) minus $6,281 fixed charges, or $24,346 per annum.

The saving made by the stokers over handfiring methods are not considered as they are offset by the extra heat content of the steam at 200 lb. pressure, 150° of superheat, as compared to the heat content of saturated steam at 130 lb. pressure.

Some Unseen Leaks in Paper Distribution

Mill Executives Have Less Data on This Than They Should Have

By HENRY FROMMES

THE paper mill executive these days, as well as his jobber and sales agent, is pretty well organized to record details of manufacture and production and the results of actual selling, balancing the various production elements in order to arrive at earnings.

Is he so sure, however, of his figures on the cost of distribution? It is very doubtful for the reason that there is no commonly accepted method of tracing and curing these unseen (but always felt) losses in distribution which oftentimes are unprovided for in the method of control.

It is much easier for the paper mill executive to have at hand almost exact figures on his **production** and costs of production as well as his sales to jobbers and consumers. In all large manufacturing industries today the unseen losses in distribution are frequently lost sight of and though the management may recognize clearly that such "leaks" exist, they have no formula for uncovering them and appraising their effect upon earnings. This point was brought to light recently by the U. S. Chamber of Commerce among others and is worth the attention of the paper industry.

Manufacturers in general are apt to be more vitally interested in the problems of production rather than in distribution and the sale of their goods which they have learned to place in the hands of the specialists —the jobber or paper merchant.

The most commonly accepted but not always carefully regarded sources of distribution losses in the trade insofar as the producer is concerned may be outlined as follows:

a—Warehousing of goods held subject to customer's order and requirements.

b—Frequent small orders from distributing agencies.

c—Return of goods delivered to agents and cancellation of orders.

d—Frequent long terms of liquidation granted to agencies of distribution.

e—Occasional excessive discounts to the trade.

Ordinary Absorption the Rule

In the course of the year, the average house absorbs the losses resulting from above distribution weak spots through ordinary channels, a provision seldom being made in manufacturing accounting and management for such irregular hazards. If the total loss through these sources should run 4 to 6 per cent of gross profits to the producer, as it undoubt-

edly does, why isn't it worth the same amount of study and remedy that would be applied if the same shrinkage was known to exist in production itself? To a great extent in the trade, the producer has control over the distribution of his product at least to the point of the jobber, merchant or middleman; he may not have control beyond that point and often does not. But the first "leg" in getting his product to market is very much a part of his production.

So concerned is the producer in the trade with maintaining the quality and quantity of his production that he very frequently faces overproduction suddenly and has to resort to abnormal trade discounts in order to reduce his inventory. This, of course, is first and all a production problem prior to the arrival of such condition but afterwards it clearly becomes one of **distribution.**

Abnormally long credit extensions also are involved in distribution and savings on production methods are often lost through deferred payment arrangements.

The general acceptance of abnormally small orders from distributing agencies also must work their toll on the producer's distribution costs, no matter how he may look at it. There has been more of this in the past three years than for decades previously in the trade.

While orders are increasing in size at present and will probably continue to do so, the small order jobber is still with us and has found that he can often operate on the manufacturer's money, once having tried it.

Extension of Territory

A good many of the manufacturers in the trade in their eagerness to spread out to new markets have found that often this isn't economically sound. The cost of long range distribution, not only in booking jobbers' orders but in transportation of them and in dealing with those without the reasonable economic range, is purely a problem of distribution in which the producer of the commodity is vitally concerned.

While there are no economical territorial limits with a considerable number of producers in the trade, there are with the majority.

It is a sound business principle today that the further away a customer is the higher the cost of doing business with him, though I have seen nothing in cost sheets in the trade to reveal this clearly and to the point where provision may be made to offset it, either by special lower discounts or other means.

The balance between production and demand in the trade has not yet reached that point (or, will it ever?) where the producer of goods can reduce the very heavy cost of warehousing his surplus and regular stocks pending its delivery on the first "leg" of distribution channels. In some industries, dealing in perishable merchandise, some such achievement has been absolutely necessary and success has crowned these efforts. But the necessity isn't so vital in the trade that storage costs of stock can be reduced by forced methods; the producer prefers to pay the warehousing charges for one reason and another.

The National Distribution Conference recently has issued a plea for uniformity among production units of determining the lost motion in distribution methods along the general lines described in this article. The trade may certainly be classified among those industries which would profit most by a sure knowledge of distribution losses as against production costs and losses. Since hazards in distribution alone subject the producer to an actual loss of anywhere from 3 to 10 per cent on his gross profit annually, the situation is one of importance.

Separate from Ordinary Waste

The purpose of the present article is not to go into the generally accepted theory that primary methods and varied methods of merchandise distribution are wasteful. This concerns the middleman and the retail outlet to a greater extent than it does the manufacturer and the consumer most of all. We are dealing here with that first step in getting the product of the industry on its way to the consumer and only within that sphere where the producer has an actual concern.

Not that general wasteful methods of distribution fail to "kick back" on the producer; they do in a great measure. They effect his business unmistakably, but over them he has no control. He can do little beyond his middleman or sales agent unless he is selling largely or in part direct to the consumer, the retailer or his equivalent.

It is believed by business experts that the first step in eliminating distribution waste of goods produced by the trade lies in that link reaching from the producer's warehouse to the middleman.

There seems to be a better chance for reform by the producer through his nominal control over the jobber than through the jobber or sales agent himself. The latter is not greatly concerned with distribution costs, at least not to the degree that he should be. His profits largely represent this cost which is carried by the consumer.

To wipe out certain distribution losses might result in the elimination of the middleman himself. It therefore falls upon the producer to work for these reforms. The consumer is largely voiceless in the matter. One of the leading executives in the trade told the writer last fall that his firm accepted considerable losses on their distribution for the reason that they were forced to do so.

"Competition is what encourages cancellation of orders, small orders and warehousing requirements of goods sold upon future delivery. We recognize the hardship such practices work on our business and to what extent they offset our savings on production. But we are powerless up to a certain point.

We have to 'play ball' with the middleman. He gets certain favors from our competitors and he expects them from us. If ever there is a tendency to unify practice in handling those matters closely related to abnormal distribution costs in the trade, you will find us in the forefront. There is no use putting up a bold front when it comes to laying down rules for our distribution agencies and then being forced into the position, suddenly, of having to back water."

Here we have the thing in a nutshell!

Lessons in Paper Making

Used in Teaching Machine Room Class in the Vocational Education Course Conducted by the Management of the Champion Fibre Co., Canton, N. C.

By HARRY WILLIAMSON
Class Instructor, Champion Fibre Co.

This article is the first of a series of lessons in practical papermaking which will be published in future issues of THE PAPER INDUSTRY, *by arrangement with the Champion Fibre Company, Canton, N. C. The lessons are a part of the general educational course conducted by this company under the direction of Mr. J. Norman Spawn, educational director.*

The author and teacher, Mr. Harry Williamson, is a practical papermaker, occupying at present the position of boss machine tender in the Champion mill.

His experience covers a record of successful achievement in his trade which began with his apprenticeship in Lancaster, England. After serving seven years of this, he operated paper machines in England, Scotland, Ireland and Sweden, coming at last to the American Continent. After helping to start the Walmsley machines in the mill of Price Bros. & Co., Kenogami, Quebec, and later running a machine in Newfoundland, he enlisted as a private soldier in the Royal Newfoundland Regiment and served through the World War. He emerged with the rank of captain and the decoration of the Military Cross. Since the war, Mr. Williamson has been following his trade of papermaking, enjoying a state of happiness as husband and father of seven bright children, and spending his surplus energy teaching his trade to his fellow employees.

One of the most helpful qualities in the lessons taught by Mr. Williamson is his demonstration of not only HOW to do a thing, but an explanation of the mechanical principles involved which will show WHY it is done in that particular way.

Introduction

THERE is in the paper industry a peculiar situation which does not exist in any other industry; and that is, the young beginner is in sole charge of the finished product.

This condition handicaps the youngster, because he does not know the **cause** behind the difficulties he may encounter. Another handicap to the young paper maker is the lack of instruction given him on the job.

Most of his information is drawn from the negative side, such as "Don't do that," etc., when he makes a mistake, and his principal source of positive information is chiefly of the "copyist" variety; that is, "I move this roll this way because I saw the other man do it."

This latter condition is being eliminated by the more progressive companies, and the company you work for occupies a leading position amongst these. Think of it! In charge of each class there is a man who is willing to give you the benefit of all he has learned in a lifetime, and all it costs you is a little of your time and the use of your brains.

That leads me to venture in a little advice. I know advice is usually unpalatable, but knowing the difficulties to be overcome, and some that are still to be met, let me offer you a course of study which will change guesswork to certainty, hesitation to decision.

To run a machine intelligently you will have many calculations to make. **Arithmetic** and **Algebra** will help your reasoning and deductive faculties.

Water plays a most important part in your trade. You will want to understand "Slice velocity," "the depth of head to carry for definite speeds," the action and flow of water through certain apertures and pipes, so you will need to study **Hydraulics.**

The study of **Pneumatics** will give you a knowledge of suction, atmospheric pressure, etc.

You use levers and weights on the press rolls and calenders, crown to overcome, deflection and allow for pressure. **Physics** will help you in calculating these things.

Anything you can study in applied mechanics will be useful, but here let me interject a word of caution: You do not need to be a specialist in each or all of these subjects. What you do need is a thorough groundwork, so that you will understand the mechanical principles of the machine in your charge.

Your principal course of study must be **Stock** or to give it the technical name, **Cellulose.** You are to be a papermaker, study the various fibres, their formation, growth, their action under different treatments.

Start now and keep right on because you can never know too much about it. One hour per day of concentrated study will advance you tremendously, and beside that it will have kept your mind questing for information.

Ask yourself a question in your trade every day,

study it and answer it yourself. Then compare your conclusion with someone of greater experience.

Not only that, write down your problem and answer at home; you will be surprised how the mere fact of you using a pencil and paper will fix the matter indelibly on your mind.

One last word in this preamble and we will start on the lesson proper. I don't want to sound like a "Dutch uncle," but I want to pass on a few words that my dad said to me many years ago: "You will find this papermaking a hard game; many men in it play cut-throat and beggar my neighbor. You were born with two ears and one mouth; give each ear an equal chance with your mouth—that is, listen to twice as much as you say." Had I followed that advice in its entirety, I would have learned more and saved myself many heartaches. I pass it on to you for what it is worth.

* * *

Lesson 1—Running a Winder

WHY do we run the paper over a winder? Would it not be just as satisfactory to slit the paper to the required size on the paper machine? Many machines, particularly in England, do that.

In response to the above question, the following reasons were developed by the class:

Why Do We Run the Paper Over a Winder?

1—To get even hard rolls, which will—
- a—Prevent damage during shipment.
- b—So that rolls will not unwind eccentric.
- c—customer will be able to use all the paper he buys without any waste.

2—So that faulty paper can be taken out and only perfect paper be sent to the customer.

3—So that we can splice breaks, which will eliminate delays when customer operates his coating machines.

4—To cut paper to size ordered and eliminate sideways weave of sheet which occurs on Fourdrinier machine. This will—
- a—Ensure that the pointing is exactly central and not offset—particularly important in soap wrapper.
- b—Ensure that the folding mechanism on envelope machine has an equal width of paper to fold on each side.

5—To cut a clean edge that will not carry paper dust, because—
- a—Paper dust makes the ink rolls on a printing press "fuzzy," blurring the printing impressions.
- b—Causes trouble and dirty spots in coating.

How Will a Soft Spot in a Reel Affect the Winding of That Reel?

1—When there is a soft spot in a reel, it means that the paper at that spot has less bulk than the surrounding sheet. A good rule to follow is—
- a—Hard spot will be **Short** and wind **Tight.**
- b—Soft spot will be **Long** and wind **Slack.**

What Is a Corrugation in a Roll of Paper?

1—A corrugation is a narrow soft spot between two extremely hard spots.
- a—If the area of a soft place is greater than the area of the hard place in a given roll, the grooved drum will smooth out the sheet without corrugation. If, however, the area of the soft place is considerably less, the grooves can not function and the slack paper corrugates between the hard spots.
- b—The best way to prevent a narrow soft spot from corrugating is to increase the diameter of the guide roll at that point by running some shaving around it; this will take up the slack behind the slitter board and give the drum a chance to receive the paper at an even tension.

If the Front End of a Roll Is Soft and the Other End Hard, Which Way Will the Paper Wrinkle and How Can You Prevent Such Wrinkling?

1—The paper will wrinkle to the soft end because there the paper is **Long** and **Slack.**

2—Increase the distance the paper has to travel at the soft end by—
- a—Letting the reel back a little.
- b—Put down the guide roll a little.
- c—Put the hook around the core at the soft end and by means of weights raise the end of the roll from the drum.

Mechanical Principles

Shear Slitters—Setting slitters correctly is one of the most important factors in successfully winding paper. Many troubles are caused either by an "incorrect set," or slitter dull or damaged, the chief of which are minute cracks which pass into the shipping roll without actually snapping off the sheet—and dust. Both of these troubles are a prolific source of complaint from customers and are directly traceable to the slitters. Assuming the slitters, both top and bottom to be sharp and perfecly circular, the most important point to consider is the point of contact between the top and bottom slitter.

A Good Rule to Follow—Set the top slitter against the bottom slitter so that they will cut the paper exactly on the same plane on which the paper is traveling. For instance, the slitter boards of "D" machine winder are set at a more acute angle than the slitter boards on "C" machine. Following our rule it becomes obvious that the top slitters on "D" be set further behind center of the bottom slitter, than would be the case on "C" machine.

The following sketches (Fig. 1), slightly exaggerated, will show this application of the rule.

The end or shaving slitters, however, demand

slightly different treatment. The sheets cut by the inside slitters maintain their plane of travel because the paper is kept at an even tension on both sides of the cutting slitter by the friction at the reel and the

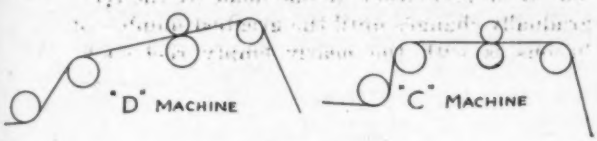


Figure 1

pull of the driving drum. The shaving is not under this tension influence, but after it is cut it does come under the influence of the peripheral speed of the bottom slitter.

If the shaving slitter is set too far back of center as in Figure 2, Sketch (A), the shaving will have a

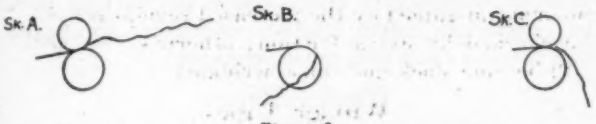


Figure 2

tendency to throw up and forward following the sheet.

If it is set too far forward of center, the shaving will have a tendency to throw down and in, wrapping round the slitter shaft, Figure 2, Sketch (B).

The best set for a shaving slitter is as near center as possible, Figure 2, Sketch (C).

All slitters should be set slightly sheared or off at the front edge. This helps to keep the cut open and eliminates the dust. Inside the cup of the top slitter there is a spring, whose purpose is to keep the top slitter pressed against the bottom slitter with a sufficient tension to ensure a steady drive—the bottom slitter being the driver and the top slitter being the driven. Too much tension will cause the top slitter bearing to become warm and sticky; too little tension will cause the slitter to slip. Both instances result in uneven revolutions of the top slitter and consequently the slitter cracks. A happy medium is arrived at by experience in "feel" of the tension exerted.

The Bottom Slitter Shaft—The proper care of the bottom slitter shaft is very important. Owing to its length on the modern winder, and the speed at which it is driven, deflection and, as a result, vibration is very liable to occur. The effect of this would cause the slitters near the center of the shaft, where the deflection would be greatest, to run eccentric; that is, the point of contact with the top slitters would be irregular. To put it in plainer language, it would be like running a 1920 Ford with a flat tire. Hippety Hop, Hippety Hop.

See that the end bearings are kept thoroughly clean and lubricated and that the center removable bearing maintains contact with the shaft either by the use of "shim" or set screws. Should the center bearing be lubricated, see that it is covered by a piece of felt; otherwise the oil will be thrown onto the paper by the shaft.

The Slitter Board

Briefly put, the function of the slitter board is to present a flat even surface, directly in line with the cutting set of the slitters, so that the paper may be as free from the influence of the revolving rolls as possible at the cutting point. It is therefore important that the slitter board be set properly, or else it fails to functions. If it is set too low as in Figure 3, the paper will be supported by the revolving roll (a) and the bottom slitter (b).

Figure 3

The speed of (a) and (b) would cause quite a vibration in the sheet so that the paper would not be steady when delivered between the slitters. Sometimes it would rise high causing a deep cut and probably slitter crack.

For ordinary basis weights of paper, set the slitter board exactly level with the rolls immediately before and after the slitters, and using the top of a bottom slitter as center.

For heavy papers, owing to the extra friction used in winding, there is a greater downward pressure exerted on the surface of the slitter board. It is therefore advisable to set the board slightly low, so that the rolls may take up the extra pressure thus created. If the slitter board was to receive all the pressure, as with the lighter paper, it would soon buckle, thus failing to steady the paper.

The Grooved Front Drum

The front drum of each pair on the winder is the last mechanical contrivance to touch the surface of the paper of a shipping roll, before the customer gets it. That statement indicates a lot. Anything which puts the finishing touch on a product before that product is subjected to the critical inspection of a buyer must of a necessity play an important part. The front drum and the friction on the reel have between them the control of the paper during winding. The resistance of the friction at the reel to the grip and driving power of the grooves on the front drum determines whether the paper will be wound into an even hard roll or a roll containing slack wrinkles and unsaleable paper.

The angled grooves cut in the drum and running from the center to each edge have very important duties to perform:

1st—The angle at which the grooves are cut—that is, leading in the center of the drum and dropping back to the edges—smooths out the surface of the paper in much the same manner one would smooth the forehead by placing the tips of the fingers over the nose and drawing them back to the temples. This action tends to smooth out slack places caused by

soft spots. It prevents wrinkling and presents an even surface equally hard.

2nd—The grooves give the drum a harder grip on the paper than a smooth drum would have. This is brought about by the slight current of air created by the revolution of the drum and the sealing action of the paper over the lips of the grooves, causing a slight suction to take place between the bottom of the grooves and the surface of the paper, thus giving the drum greater gripping power, which means a harder wound roll.

3rd—The higher the finish on a sheet of paper, the more is the gripping power of the suction thus created in evidence. When the paper is bulkier and of a coarser finish, the small inequalities in the surface of the paper refuse to maintain the seal over the lips of the grooves, thus breaking the gripping power of the drums intermittently. This is one of the principal causes of the slight travel of the sheet from side to side, presenting an uneven edge appearance in the finished roll.

4th—The grooved drum is fitted with a cone pulley drive, very gently graded to ensure the lightest increase or decrease of its speed.

General Operation

The word "Tension" could most appropriately be used to sum up the means of control on the winder. The resistance of the friction applied at the reel to the pulling power of the grooved drum determines the quality of the winding. In starting the winder, after threading the paper over and onto the cores, the third hand should operate the starting levers, while the fourth hand applies the friction. Both jobs, done simultaneously, will ensure the paper being kept at an even tension and as a consequence, will form a hard foundation around the core, upon which the paper can be successfully wound. The neglect of this will cause the first few revolutions of paper around the core to be slack and when friction is afterwards applied, the greater tension or pressure will cause the slack wound foundation to flatten out.

The result being that the reel will not be circular and it will run eccentric, or the slack paper will be squeezed out, resulting in a slipped roll.

Too much friction applied when starting will have a tendency to lift the iron cores from the surface of the drums. Generally speaking, the control lies with the greatest diameter.

At the start, the diameter of the reel in the stands is the greatest and the driving drums should be favored a little by increasing the speed of the grooved drum, using for this purpose the cone drive—just enough friction applied to keep an evenly taut sheet. As the rolls on the drums increase in size, there is a corresponding decrease in the diameter of the reel and the point of control is shifted to the drums. Slow down the grooved drum to normal and apply more friction at the reel.

The reason for this shifting of control is that at the start with a 4-inch diameter core and a 28-inch diameter reel of paper, the core will make approximately 49 revolutions to one made by the reel. This gradually changes until the greatest number of revolutions is with the nearly empty reel shell. The

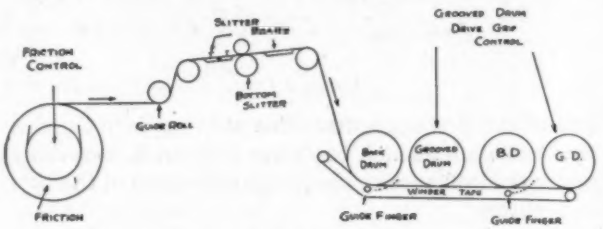


Figure 4

momentum gained by the increased revolutions must be checked by extra friction; otherwise the paper will become slack and cause wrinkles.

Winder Tapes

The winder tapes, acting as carriers, deliver the paper—now cut to the desired width—to the particular pair of drums upon which it is to be wound. Again tension plays an important part. The tapes are driven and are in contact with the revolving drums. The paper is held against the back drum and delivered to it by the pressure of the tapes.

Granted an adequate number of tapes to each sheet and equally taut, an even delivery of the paper to the drum will result. Should the tapes in the middle of the sheet be taut and those at the outside edges be slack, the edge of the paper will sag, causing a tight wrinkle or fold in the middle of the sheet. With the edge tapes tight and the middle tapes slack, the paper would have a tendency to pucker as it comes in contact with the grooved drum.

Winder Stands

Equipped with a gear wheel which operates in a fixed rack, each winder stand can be moved to any desired point in the width of the winder. Once in position, it is securely held by means of a lock nut. The stand itself is simply a strong, right-angled bracket with its vertical arm fitted with a planed steel face plate. Along this face plate slides the brass box which in turn fits over the bearing in which the core runs.

The stand and box are designed to resist the end thrust of the core and prevent sideways travel while the paper is being wound. It is so arranged that the center of the box will be exactly over the center of the open space between the two winding drums.

This central spacing ensures equal contact of the roll of paper, itself a circle, with each drum, whether the diameter of the paper roll be large or small.

Should the face plates become loose, it would lean slightly forward, causing a greater contact of the paper with the grooved drum. The result would be

tight and slack winding according to the oscillation of the roll of paper on the drums.

Again there is only one winder stand to each roll of paper, the other end of the core riding free. Should there be resistance to the free movement of the box along the face place, caused by a badly fitting box, or roughness in the plate itself, the effect would be equal to placing greater weight at the binding end, resulting in a tight wind at the point of greatest resistance and a slack wind at the free end.

Summary

The winding of paper is not merely a mechanical process. It calls for the use of intelligence. The winder is equipped to eliminate the irregularities in the length of the web of paper made on the machine. By a thorough understanding and application of the mechanical principles the third hand and his assistant, the fourth hand, can do much toward producing perfect rolls from an imperfect reel.

Were conditions always ideal and only the most perfectly built reel delivered to the winder, it would simply be a matter of starting and stopping a piece of machinery. The ideal, however, is scarce anywhere and a particularly elusive rarity in a paper mill; therefore the guiding hand is necessary.

The control of the winder is the first sole responsibility placed on the shoulders of the "budding" paper maker, although it is small compared to the Fourdrinier machine. Yet in its operation, it embodies principles that will prove of immense value to the third hand when he eventually becomes a machine tender.

Tension is the key word as applied to the paper and **Attention** should be the motto of the third hand to the upkeep and care of the winder in his charge. Add the two together, **Tension** plus **Attention**, and there will be a noticeable decrease in the number of complaints received. Not only will the boss be satisfied, but still more important, you will have satisfied yourself and produced perfect rolls.

Practical Water Testing for the Papermaker

Methods That Can Be Applied by Any Skilled Worker Whether Chemist or Not

By DR. THEOBALD BENTZEN
Chief Chemist, Whiting-Plover Paper Company, Stevens Point, Wis.

ON NOTHING so much as serviceable quality and adequate quantity of the water used in its operations is the life of a paper mill so dependent. For it must be remembered that every pound of paper is brought into contact in the course of manufacture with 50 to 100 gallons of water and that the suspended matter, normally present in water, and much more the dissolved substances, are of great consequence as regards their influence on the quality of the paper, especially on the sizing and coloring of the pulp.

Therefore, before a paper mill is built, the water should be carefully investigated and tested rigidly with respect to its quality and quantity during the different seasons and changing climatic conditions (drought, heavy rainstorms, floods, etc.), with consideration for the influence of nearby cities, factories, mining operations, etc.

But as man does not generally possess as much forethought as afterthought, most paper mills have to endure existing water troubles and this makes it necessary for the papermaker to be able to test the mill water in order to control its quality, be prepared to meet troubles, and so far as possible counteract them.

The intention of this discussion is, therefore, in a plain way, avoiding all abstruse scientific terms, to demonstrate to the professional papermaker (the non-chemist) simple methods of water analysis, which are nevertheless practical and sufficiently exact for such purposes as the determination of turbidity, hardness, and iron, because these three qualities under certain conditions are likely to cause nearly all the troubles of a paper mill.

This examination of the mill water should be performed with some regularity, once or twice a week if necessary, and of course it should be repeated whenever exceptional conditions warn us to look out for approaching trouble. As a matter of course, the superintendent must keep explicit records, giving full information and exact details concerning these investigations.

Turbidity

(A) **Qualitative Determination:** Fill about 1000 cc. of the water into a graduated glass cylinder (tall form) and leave it long enough for the suspended matter to precipitate, and the water at the same time to become clear. The amount of sludge on the bottom of the cylinder should as far as possible be estimated according to the scale of graduation on the cylinder; the time it took for settling should also be entered on the records, as the two figures may serve as approximate values for the purpose of comparison. The finer the dispersion of the matter, the

slower it will settle and the more difficult it will be to filter the immense supply required.

The turbidity may be due either to mineral or organic substances, and these can be readily distinguished by examining the deposit through a sufficiently powerful magnifier or under a microscope. Mineral matter will prove of no consequence, as any impurity of this kind can be removed by mechanical filtration, but if the deposit contains much organic matter, this would not all be removed by filtering. If the organic matter in the water should have any staining or tinting properties such a water would, of course, be unsuitable for the manufacture of high grade papers.

(B) **Quantitative Determination:** As in many mills the turbidity is liable to periodical or temporary changes, as previously stated, it becomes necessary to determine the exact amount of suspended matter present in the water. To perform this test, a not too small ribbed glass funnel is furnished with a tough filter paper, made especially for this kind of work, of which the exact air-dry weight is known. Exactly 1000 cc. of the water is passed through the filter. The air-dry weight of the filter, plus the retained matter or residue and minus the air-dry weight of the filter itself, will then represent the amount of suspended matter per 1000 cc. of water, and this amount multiplied by 1000 will give the parts of suspended matter present in one million parts of water. (The results of water analyses in the United States are as a general rule expressed in parts per million.)

It is impossible to base any theoretical opinion about how many parts per million of suspended matter must be present to render a water unfit for papermaking; or, on the other hand, how many parts per million may be present without causing any harmful effect, as this would depend on the character of the matter held in suspension, especially as to whether or not it would stain the stock. Experience is the only guide, and correct and detailed records the only aid.

If the erection of a filter plant should prove to be necessary, care must be taken that it be constructed in such a way that it can be cleaned and eventually repaired in sections, as otherwise trouble will be experienced as regards quantity and quality of water supplied during the repair periods.

Hardness

Water which requires an excessive amount of soap to form a lather is called "hard water." This condition is caused by certain mineral salts dissolved in the water, principally calcium and magnesium. The degree of hardness is expressed by the amount of soap required to establish a lather that will remain unbroken for at least five minutes.

Without going into details concerning the different systems, estimations and calculations, founded upon this method, we shall only consider the method most commonly used, the original Clark Soap Test.

The standard soap solution to be used for the determination of the degree of hardness is rather difficult to prepare and to standardize (see H. P. Stevens: The Paper Mill Chemist, chapter on Water), and if he is a non-chemist, the papermaker would do better to order this solution from some chemical manufacturer who prepares reagents as a specialty. This holds good, too, as a rule, with respect to all other solutions mentioned later in this discussion.

The soap solution ordinarily used is of the same strength as that recommended by Dr. Clark, but the original English degrees indicating grain of calcium carbonate per one imperial (British) gallon of water, has as a matter of convenience for American readers been converted into terms of the metric system.

In testing a sample of water, 50 cc. of the water is measured into a stoppered eight-ounce bottle and the soap solution added from a burette in quantities of 1 cc. at a time, with intervals of vigorous shaking. This is continued until a lather appears which remains unbroken for at least five minutes, when the bottle is laid upon its side. The sound and feel when shaking the bottle should be noted, as the shock is less violent and the sound softer whenever the necessary excess of soap has been added.

From the number of cubic centimeters of soap solution used, we are able to determine the degree of hardness, expressed in the proportion of calcium and magnesium salts present, according to their equivalent value as calcium carbonate or limestone.

In the above mentioned book, The Paper Mill Chemist, a table is printed giving the result of parts of $CaCO_3$ (Calcium carbonate or limestone) per 100,000 water, according to the number of cc.'s soap solution and per 50 cc. of water, and in "Standard Methods for the Examination of Water" another table is given stating the result in parts per million.

It must be admitted that a considerable amount of practice is necessary before this test can be successfully carried out. I shall therefore direct attention to a method which is easier to perform, with results sufficiently exact to determine the approximate degree and changing variations of the hardness, all of which the professional papermaker desires and requires to know.

I refer to the water-testing method and outfit of The Heller & Merz Company, New York, consisting of a 4-oz. mixing bottle graduated to 40 cc., and a dropping bottle with a soap solution of such a strength that one drop registers one Clark degree. In this way the number of drops necessary to produce a lather holding for five minutes, when the bottle is laid upon its side, will express the degree of hardness as Clark degrees. As one Clark degree is equal to 14.3 parts per million, it is only necessary

to multiply the number of drops used by 14.3 to express the hardness in parts per million.

I may illustrate the necessity of a papermaker knowing the degrees of hardness of the water at any time, especially under changing conditions, by an example from Stevens's book.

The concentration of pulp in the beater is, say, 5 per cent or about 3 lb. per cubic foot. To state it differently, a beater taking 2 cwts. of dry rag will require 448 gallons of water. It is no unusual thing in many districts for the water to contain 20 grains of hardness per gallon (20° Clark or 20 drops Heller & Merz solution per 40 cc. of water.—Th. B.) so that every ton of rags will be brought into contact with $20 \times 4{,}480 = 89{,}600$ grains or nearly 13 lb. of calcium carbonate, which will require about 14 lb. of alum to neutralize it. This alum is simply wasted, used up without having produced any effect on sizing the paper. It partly accounts for the fact that the papermaker has to add far more alum than is theoretically required for reacting with the rosin size.

A water of more than 12½° Clark (the equivalent of 179 parts per million) is regarded as hard, and without going into the question of hardness of water as the cause of scale formation in the boiler, it will simply be noted that a hardness of about 3° Clark is the most preferable for this purpose, as a scale of only ⅛" thick causes five times as much loss of fuel as a boiler plate $\frac{5}{16}$" thick.

A hard water can be softened with the aid of certain chemicals, as lime and soda, which with respect to the boiler water may easily be done, but if manufacturing water has to be softened, this must be done in a way that sufficient but not too much of the compounds are used, or the medicine may prove worse than the disease.

Iron

The solid outer crust of the earth is composed of several different elements, among them being about 5 per cent iron. It is easy then to understand that the water during its circulation, and upon its way through the earth, will have every opportunity to combine with iron, and that most water does contain iron.

Where high grade papers, such as photographic base paper and blueprint paper, of an extremely white tint have to be produced, the iron content of the water is of decisive importance. The proportion of iron which is allowable for such papers may be put at a maximum of 70 to 200 parts per million.

(A) **Qualitative Determination:** About 5 drops of iron-free 30 per cent nitric acid is added to 10 cc. of the water to be examined, after which it is heated to boiling in a small beaker or Erlenmeyer flask (pyrex glass preferred) and then transferred to a test tube and cooled off. Then from 5 to 10 drops of a 10 per cent solution of ammonium sulphocyanate (10 grams of the salt dissolved in sufficient distilled water to make 100 cc.) is added. This reagent, which is very sensitive, develops a red color if iron salts are present.

If no red color develops, we must evaporate 1,000 cc. of the water (boiling it in a beaker) until reduced to about 10 cc. volume, whereupon a few drops of iron-free nitric acid is added, and the evaporation continued until only a volume of about 1 cc. is left, which is transferred to a test tube and cooled off. About 5 drops of the 10 per cent solution of ammonium sulphocyanate is then added and if the solution does not turn red it is proof that the water is free from iron. If the color change occurs in the strong evaporated sample but does not show up in the original water sample, it would demonstrate that only traces of iron were present, which would be negligible in the manufacturing process.

(B) **Quantitative Determination:** If on the other hand the test of the original water (before evaporating) developed a distinct red reaction, this would prove the presence of iron in larger amount than mere traces, and it would then be desirable to know the amount, expressed in parts per million. For this determination the colorometric method is quite serviceable and sufficiently exact. The depth or intensity of the color caused by the reagent is compared and estimated with the use of standards having a known iron content. For this the following equipment is required:

1. A burette with straight glass stop-cock, capacity 25 cc., graduated in 1/10 cc., with support.
2. A volumetric flask of 100 cc. capacity.
3. One or two pipettes, 5 cc. capacity.
4. A set of two Eggertz color comparison tubes, capacity 30 cc., graduated in 1/10 cc., and some tight fitting selected corks.
5. A 10 per cent solution of ammonium sulphocyanate.
6. Pure ether.
7. A 30 per cent solution of pure nitric acid (absolutely iron free).
8. A concentrated solution of ferric ammonium sulphate (iron alum) prepared as follows: In a graduated mixing bottle of 1,000 cc. capacity dissolve 8.630 grams ferric ammonium sulphate in 500 cc. distilled water, to which has been added 5 cc. concentrated sulphuric acid, and add:

Distilled water, sufficient to bring the volume up to 1 liter.

According to the formula and molecular weight of the ferric ammonium sulphate, this concentrated solution contains 1 gram of iron per liter, or 0.001 gram per cubic centimeter.

For the determination, the solution must be diluted so that 1 cc. of the concentrated solution will be contained in 100 cc. of distilled water. In this way the diluted solution contains 0.001 gram of the salt

per 100 cc., or 0.00001 gram per 1 cubic centimeter.

The colorometric test method consists of two interdependent manipulations:

(A) The water to be tested with help of the reagent (ammonium sulphocyanate) and

(B) The production of a similar shade of color in an equal volume of distilled water, containing the same amount of the reagent by adding ferric ammonium sulphate until the end reaction is obtained.

The amount of ferric ammonium sulphate used, will then, owing to the reaction of the iron contained in it, enable us to calculate the proportion of iron present in the mill water.

These two manipulations are performed separately in one of the two comparison tubes, which to avoid repetitions and obviate misunderstandings and mistakes of identity, shall be designated as Tubes A and B, according to the two manipulations.

(A) Of the water to be tested 99 cc., and 1 cc. of the 30 per cent iron-free nitric acid are placed in a volumetric flask of 100 cc. capacity, thoroughly mixed and boiled for a few minutes, whereupon it is cooled and filled to the 100 cc. mark. With a pipette, 5 cc. of this acidified water is transferred to Comparison Tube A, and 5 cc. of the ammonium sulphocyanate solution added, followed by 10 cc. of ether, the tube with the mixture being then shaken until the watery layer is decolorized.

(B) Of the mixed solution of 99 cc. distilled water and 1 cc. of 30 per cent iron-free nitric acid, 5 cc. is transferred to Comparison Tube B. To this are added 5 cc. of the ammonium sulphocyanate solution and 10 cc. of ether; from a burette, filled to a volume of 25 cc. with fresh diluted ferric ammonium sulphate solution prepared as previously directed, there is added slowly and carefully, during vigorous agitation of the tube, just enough of this solution to render the ether layer in both tubes exactly of the same shade of color.

The amount of ferric ammonium sulphate solution added to Tube B in order to produce the same shade of color as Tube A will inform us how much iron is present in 5 cc. of the mill water, seeing that 1 cc. of diluted ferric ammonium sulphate solution is the equivalent of 0.00001 gram of iron. This figure multiplied by 200,000 expresses the proportion of iron present in parts per million.

Should more than 2 cc. of the ferric ammonium sulphate solution be required to obtain the required shade of color (where the mill water contains much iron), then the water must be diluted with distilled water: for instance, 50 mill water + 50 distilled water; 25 mill water + 75 distilled water, etc., and of course the result (expressing the proportion of iron) must be multiplied respectively by 2, 4, etc.

If the water is weak in iron, it must be concentrated by evaporation, thus 100 parts may be evaporated to 10, and again brought to volume with 90 parts of distilled water. The result must, of course, be divided by 10 to get the true figure. But the proportions of 1 cc. of acid to 99 of water to be tested and 5 cc. water + 5 cc. of ammonium sulphocyanate solution + 10 cc. ether must always be the same.

Without going into details concerning the different systems of freeing water from iron, it is sufficient to say that most of the systems in use (for instance The Shower-Silicic-Filter system or The Coke Dizzling system) work quite satisfactorily at a comparatively low cost.

A Handy Floor Sleeve

ENGINEERS in charge of pipes in paper mills will probably be interested in this sleeve used by a prominent engineering concern in the east. It is made along the lines shown in the accompanying sketch for pipes passing through all kinds of floors.

The curb (C) is intended to protect the pipes as well as to form a neat appearance around the pipe opening. It is also to prevent the sweepers from pushing dirt from the floor above down through the

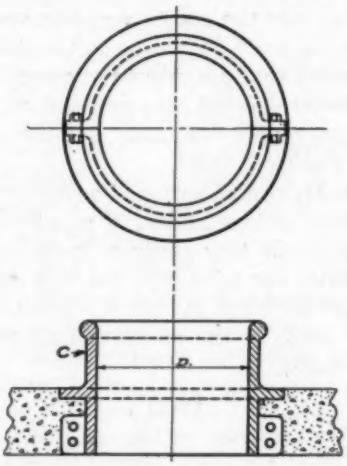


Figure 5

hole and possibly upon workers beneath or onto machinery or other equipment located on the floor below.

This floor sleeve is made of cast iron and in all sizes. It is also made with split lugs for bolts on the sides for the larger sizes or for placing around pipes which are already in position. In order to assure concentric alignment of the sleeves with pipes it is advisable to leave holes in the floors larger than the actual requirements and to put the pipes in place and then locate the sleeves and grout them into position with cement.

The inside diameter of the pipe sleeves should be large enough to allow passing the flange or coupling of the pipe through same. For larger sizes, for instance, (d) may be made two inches larger in diameter than the diameter of the pipe flange. This allows for easy working and avoids trouble if at any time changes in piping are necessary.—Schaphorst.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Oil Burner Diagrams

THE writer has noticed for several years that manufacturers of oil burners, by means of graphical diagrams, are able to make particles of oil do all sorts of acrobatic stunts out in the combustion chamber after the oil has left the mechanism. I have often wondered how they can do it.

At last I find a diagram as shown in Fig. 1 that looks as though it may be about right. The path of

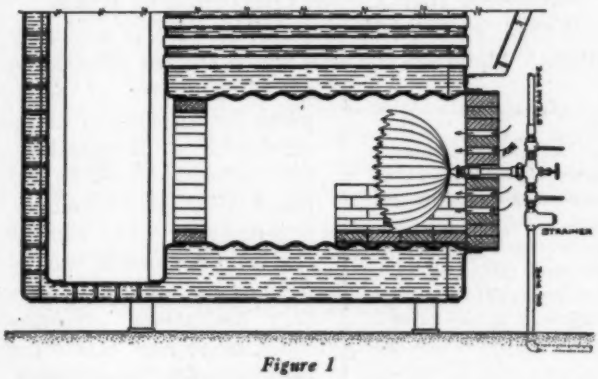


Figure 1

the oil and likewise the path of combustion is curved rather than along a straight line. Usually the entry oil is shown as a cone. I have an idea it is more of a paraboloid. Fig. 1 shows it to be a true circle, but this was probably shown as such simply because it is easier to draw a circle than a paraboloid.

Fig. 2 is one of the diagrams that I have often

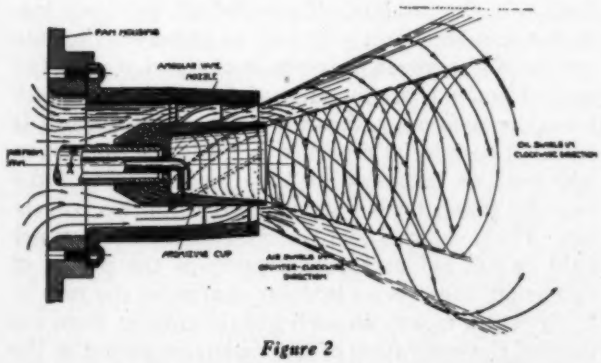


Figure 2

admired in which arrows show that the oil moves in clockwise and counter-clockwise directions out in the open space in spite of the old law of physics which declares that bodies in motion remain in motion in a straight line and not in curved paths unless acted upon by some outside force. Thus, when a flywheel explodes the pieces of the flywheel move in a straight line aside from the motion due to the force of gravity and they **do not** move in circles.

Fig. 2 is typical. I have seen a great many similar to it and I imagine that readers of THE PAPER INDUSTRY have also seen similar diagrams.

Equal Tension on Both Edges

NOT long ago this question was put to me:

"Please tell how you put a quarter-turn belt on the pulleys so that there will be equal tension on both edges of the belt and the belt will not be stretched or strained entirely on one edge."

This can be done by going through the motions of joining a belt in the usual way, but before joining simply give one end of the belt a turn through 180 degrees, before splicing. Thus, after being joined together you will have both the flesh and hair sides on the outside at the joint, as well as on the inside.

The action of a belt spliced in this way is to turn itself over every revolution of the belt so that the maximum tension is first on one edge during one revolution and on the other edge during the other revolution. In other words, during one revolution the flesh side is next to the pulleys and during the next revolution the hair side is next to the pulleys. This method usually works out very well.

Of course, if the belt is a double belt there is no flesh side, but one should have no difficulty in giving one end of the belt one turn as instructed above.

To Make Wire Guards

AN EASY and excellent way in which to make wire guards for almost any kind of machine is to make the frame work out of angle iron and the sides out of wire cloth of suitable mesh.

First make the frame. Angle iron is not easily bent without cutting out portions of the flange. That is, cut out some V's from the inner flange where the bend is to be made. If the bend is to be 90 degrees, cut out a square V. If the bend is to be 45 degrees, cut out a 45-degree V, and so on. In other words, cut out a V whose angle is equal to the bend wanted.

After the frame is formed, put in the wire cloth or screen. The quickest way to fasten the wire in place is via the welding torch. The same torch may be usefully employed for welding the frame work together before proceeding with the wire. Simply "spot weld" the wire terminals in place on the inner flange of the frame. It doesn't take much time to do this after one knows how to operate a welding flame.

If no welding outfit is available, the wire may be either riveted or bolted in place. Punch holes through the inner flange at the wire terminals and then rivet or bolt. When carefully made, entirely of metal, a guard should last indefinitely.

How to Forestall Penalties and Interest Charges

Nature of Offences and Their Penalties Show Clearly the Importance of Frankness and Prompt Returns

By M. P. SNOW
Public Accountant and Tax Counselor

AN OUNCE of prevention is worth a pound of cure.

When you are talking about taxes, this is especially true.

To know how to avoid penalties and interest charges is to know how to save money. It is so much easier to avoid them than remove them.

Of course, in order to understand just how important penalties are in the tax field, it is necessary to know the nature of the penalties which Uncle Sam imposes. In talking about penalties in this story, I am taking the position that none of my readers handle their tax matters in such a way as to incur the punishments inflicted by the tax laws in cases where actual fraud on the part of a taxpayer is involved. It is my experience that 98 per cent of the taxpaying world is willing to pay a just amount of tax. People do not, in many cases, consciously and deliberately lay themselves open to the severe measures covering those who proceed in defiance of the law.

While the following article deals with "the darker side" of tax matters, it is as much of a money-saver as if it were telling you just how you could go about getting refunds.

Remember also that if you think you have refunds coming to you for any of the years 1917, 1918, 1919, 1920, *or* 1921, *there are certain provisions in the new tax law which in a great many cases operate to hold open these years, and to make your claim valid for this period.*

If you think you have refunds coming for any of the years 1917 *to* 1921 *inclusive, and would like to know whether these years are still open, address your inquiries to the editor.*

So, for these penalties for the worst type of tax offence, I will say nothing further except that in the worst cases they run up to thousands of dollars in fines, and several years imprisonment.

But let us look at this time at those penalties asserted for the more ordinary mistakes we make on our tax return.

Distinctions made by the tax laws as to the sort of offences for which penalties are imposed, are rather hard for the layman to grasp. But behind all these penalties is the idea of intent. What is the purpose of the person who fails to pay his tax on time, who fails to file a return, who fails to pay any tax at all when he should have done so, or any of the other sins of omission or commission which the taxpayer may be penalized for?

Did he act in ignorance of what was the right thing to do, or did he simply go about deliberately to defraud the Government out of the amount of taxes coming to it? Different measures are provided by the Government for the varying types of offences.

Case of Intentional Disregard of Rules

There is one group of culprits which is unusually large. These are the ones which the tax laws define as being guilty of negligence or intentional disregard of rules or regulations, but without intent to defraud. For these offenders, a penalty of 5 per cent of the total amount of the deficiency is imposed. Certain limitations are provided as to how this 5 per cent penalty shall work, with respect to taxes paid in installments, but they are h a r d l y important enough to be mentioned at great length here.

Charge for Over Due Payments

"Delinquency" cases come in for considerable attention in the tax law. If you did not pay your tax, or the installment on your tax, on or before the date set for its payment, interest is charged you on the unpaid amount to the tune of 1 per cent a month from the time prescribed for its payment, until it is paid. Also, special provision is made for the person who gets an extension of time for payment of the amount which he has determined to be his correct tax. If the amount and the interest thereon are not paid in full before the expiration of the period of extension, there is an interest charge at the rate of 1 per cent a month on such unpaid amount from the date of the expiration of the extension period to the time the payment is made.

Of course, it is no news to most of you who read this story that interest is charged on extensions, but when you fail to meet the extension, you have to pay at the rate of 1 per cent a month, or 12 per cent a year. The same monthly charge is made on deficiencies, etc., which are not paid within 10 days from date of notice and demand from the Collector.

In another part of the law, a penalty of 25 per cent

of the tax is asserted against those who are delinquent in filing their returns. In case of failure to make and file a return within the time prescribed by law, or prescribed by the tax administration in its regulations, the Commissioner of Internal Revenue, who administers taxes for the United States, may add to your tax 25 per cent of its amount. There are cases where this penalty is not asserted, and the law specifically mentions them. For one thing, the law says that the penalty is to be imposed, excepting where a return is filed after the proper time for filing, and it is shown that the failure to file it was due to a reasonable cause and not to wilful neglect.

It is my experience that the Government has not been very rigid in enforcing this particular 25 per cent penalty except where it was obvious that the person held off filing in order to defraud the Government out of its taxes.

Where this 25 per cent is added, it is to be collected at the same time and in the same manner and as a part of the tax, unless the tax has been paid before the discovery of the neglect to file, in which case the amount so added is to be collected in the same manner as the tax.

Law Regarding Installment Deficiencies

Now, as to the interest on deficiencies, let me say that the new law has made a change in the length of time which interest runs in the case of installment payments. Under the 1924 act, interest on the amount assessed as a deficiency was pro-rated to each installment from the date prescribed for the payment of the installment—where the tax was paid in installments—but in the new law, interest runs from the date prescribed for the payment of the first installment. Of course, this is not so good for the taxpayer. In case you filed a waiver of your right to appeal to the Board from a part or all of the deficiency, then the interest runs to the 30th day after the filing of this waiver, or to the date the deficiency is assessed, whichever happens to be the earlier.

The new law also has made some changes about interest on deficiencies for years prior to 1921. You will recall that under the 1924 law, no interest was charged on a deficiency in taxes for years before 1921. In the 1926 law now effective, it is provided that interest is to be collected in such cases at the rate of 6 per cent from the date of the enactment of the new statute to the date the tax is assessed. Or, if you filed a waiver of your right to appeal to the Board, this interest runs to the 30th day after your waiver was filed, or to the date on which this deficiency was assessed, whichever happens to be earlier.

Where an assessment was made before June 2, 1924, interest begins to run from the date of the new 1926 law and goes right up to the date of notice and demand from the collector.

There is no more convincing argument for forestalling penalties and interest charges than to know the real nature of these charges.

Be sure to file your returns on time, and thus avoid the possibility of either a 1 per cent a month interest charge, or the 25 per cent additional charge. It would be a very hard thing, for example, for you to pay 1 per cent a month interest, and a 25 per cent flat tax on a tax return which you filed in, let us say, 1922.

Even if you are only a month or two months late, if you had no convincing reason for your tardiness at this time and you were assessed, let us say the 25 per cent penalty and 1 per cent interest charge, that would be 26 per cent. If the tax which you should have paid was only $1,000, then you would have to pay $260.00 additional, so that you can see it is very important that you file returns right on time.

If you did not file your return by March 15, and obtained an extension to May 15, and for any reason you have not been able to get your return in by this latter date, by all means get it in at the earliest minute possible, so as not to incur the heavy penalty.

Promptness and Frankness Important

Give the Government no reason for thinking that wilful negligence or undue delay has played any part in your tax dealings. One policy which I have always advocated and have seen work out with very fine results, is that of giving the Government all possible information on transactions which may cause any question. No matter whether it is a bad debt, a general expense item, or some other thing that the Government may question, make it a point to give all possible information about it. This is one of the surest ways of avoiding penalties.

You will hardly be able to avoid the regular 6 per cent interest charge on any real deficiencies because if you owe the Government that money, you are expected to pay it, but you can avoid the heavier 1 per cent a month penalty and the large flat penalty, which are in many cases almost disastrous.

I feel that I cannot urge too strongly that you give the Government all possible information on deduction items, and that you make it a matter of religious practice to get your returns in on time.

A great many of you at this time are giving thought to your fiscal year returns. Thousands of concerns in the United States are filing on the basis of a March 31 or June 30 fiscal year. Those who file on a March 31 year have until June 15 to file their returns, and should keep carefully in mind the facts with respect to penalties mentioned here. Those concerns which file on the basis of a June 30 fiscal year of course have until September 15 to file, but many of them will begin filing early in order to get the matter off their hands as early as possible and not be rushed at the last minute. They will do well to file just as early after the close of their fiscal year as possible, so that will eliminate any possibility of delinquency and subsequent penalty.

Editorial Comment

By WILLIAM SIBLEY

Sheet Steel Transparent as Glass

DR. KARL MUELLER, member of the staff of the Physical Technical Institute of Berlin, has recently succeeded in producing sheets of steel so thin that they are as transparent as the clearest glass, according to an announcement of that institute. The new method of making sheets of metal of unprecedented thinness seems likely to prove of far-reaching industrial as well as scientific importance. The test plates used to determine the transparency of optical glass and which were ruled with cross lines twenty-five hundred to the square inch, were photographed through such a metal sheet, and when enlarged to four hundred diameters the scale lines showed distinctly and with no trace of distortion. This absence of aberration conclusively proved that the structure of the film was perfectly even and equal in all directions. The metal sheets are so thin that atoms will penetrate them without impediment, yet so strong that when fastened in a frame they may be bent (by blowing) to the extent of a sixteenth of an inch without rupture. The delicate sheets are made by depositing an extremely fine film of the metal on a smooth surface by means of the electric current, then afterwards separating the film from the foundation on which it was fixed.

Such sheets will have an important place in many different kinds of scientific and industrial research since they may be used as membranes for the separation of gases, or lend themselves to the progress of television and telephotography. They may also be found valuable in the development of radio receivers, galvanometers, and for instruments that measure the action of the heart, lungs and other physical organs.

Electricity—a Business Barometer?

IN a recent address, Mr. Arthur Williams, vice-president of the New York Edison Company, voiced the opinion that the consumption of electricity indicated, in a large measure, the condition of general business. Mr. Williams even went so far as to predict that the electrical unit of measurement, the kilowatt hour, would presently become one of our most reliable barometers of industrial and commercial activity—that it would soon take its place with car loadings, unfilled steel orders, and other industrial factors, as an indication of existing business conditions.

There is much food for thought in the suggestion. Electricity is of almost universal use. So much so that it enters into all industry, and to a very great extent into particular industries. With the possible exception of the mail, it is the prime mover for all instrumentalities of communication, while except for the steam railroad, it enters largely into all facilities for transportation. Even the rail transportation is rapidly increasing its usage of electricity. Indeed, any force so general and flexible in application as to have 65,000 different uses could surely lend itself as a measure of existing trends.

Because 86 per cent of all electrical energy produced in the United States comes from public utilities, it would be comparatively easy to gather and compile accurate statistics in the matter of production and consumption. Indeed, the electrical industry is already well organized and correlated under the single head of the National Electric Light Association, and this body even now has available all necessary data to provide a basis for establishing an analysis. That association shows, for instance, that during 1920, 39,519,129,000 kilowatt hours were produced, and that this amount dropped slightly in 1921, only to recover in 1922, then continue its steady advance to 1925, when the output was nearly 61 billions. It is significant that bank clearings for these same years show exactly the same trend.

Since all electricity used in the country can be expressed in terms of kilowatt hours (equivalent to one and one-third horsepower) and since the sources of consumption are definitely known and can be readily calculated, the new barometer of business can be easily broken down into units or particular industries and made to reflect individual as well as general trends. As an example, we will consider the street railways, all of which are electrified. Since they use only the amount of power necessary to pull the load—large consumption when traffic is heavy and smaller consumption when traffic is light—any accurate calculation of the total power used by the 880 street railways of this country would definitely and accurately reflect the existing conditions in that branch of the transportation industry. The same principle would apply to all phases of manufacturing in which the degree of electrification has been predetermined.

—— on Timely Subjects

Since the advent of better banking systems and regulation we have been crediting the Federal Reserve System with the honor of keeping us out of commercial and financial panics, warding off periods of deflation and eliminating eras of over-production. Doubtless much of this credit is well placed, for the Federal Reserve System, a disappointment in some ways, has really done much to stabilize commerce and finance. But we should not overlook the fact that we have statistics and business indicators today that were non-existent twenty years ago, that because hereof the average business man is far better informed than those men of previous years—that we are now permitted a measure of self-guidance never before known. We have need for all the reliable indicators that are obtainable. We already have several good ones, but if we can accurately check our prosperity, or lack of it, by kilowatt hour consumption, much good would come of the development of the new barometer.

The Need for Statistics

PROBABLY no large manufacturing concern is today conducting their business without the reliable guidance of accurate statistics. So universally recognized has become the value and the necessity for recording and charting the more important facts regarding the progress of any business that the great majority of the large industrial corporations maintain statisticians or a complete statistical department. Through these they chart, for ready visualization, the prevailing trends in purchasing, sales and production, as well as obtain therefrom a clear understanding of the existing conditions in lines affecting their business. That such employment of statistics is profitable has been clearly demonstrated under greatly varying conditions.

In many of the small or medium sized companies, however, this valuable guidance is foregone. Only a few of the smaller manufacturing or distributing firms make adequate and proper use of statistics, many of them depending upon their ability to "mull it through" as best they can. This condition would not long exist if more of the smaller firms realized that accurate and reliable statistics could be had with comparatively little effort and at practically no expense. The belief that statistical helps require the outlay of an exceptional investment or the establishment of a special department is entirely erroneous. Any bookkeeper or accountant, under the capable direction of an executive, can compile accurate and reliable figures that may easily be plotted on a chart and made to show existing trends. These, furthermore, can be continued with a minimum of effort. Such factors as production costs per unit of product, various department expenses per unit of production, sales expenses in contrast to volume, and like information, can be compiled without the need for a trained statistician. In addition, any intelligent clerk can keep the plots on the chart up-to-date and accurate.

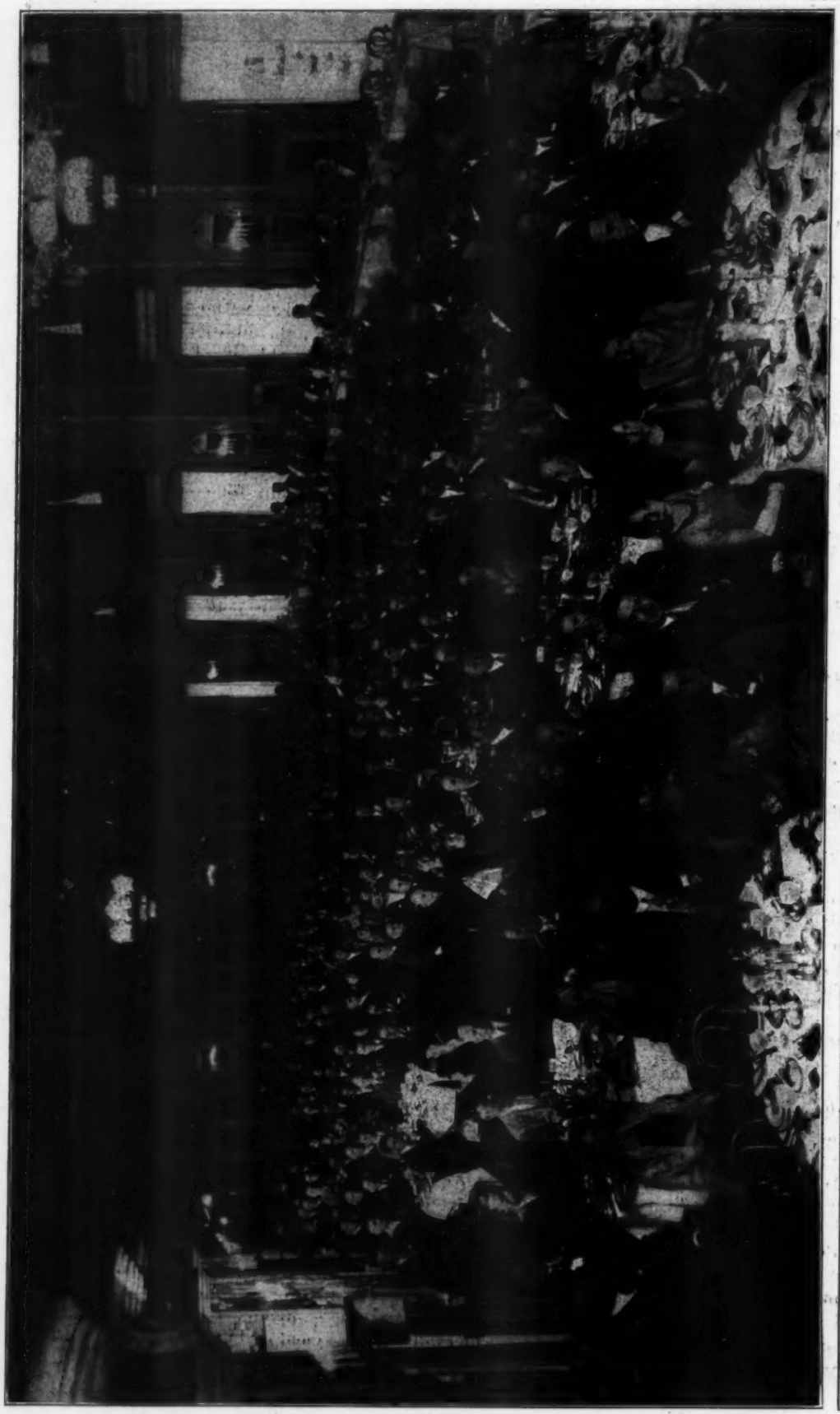
Continued over a period of a year or two, such charts have increased value. In not only sales and production, but in purchasing expenses and overhead, peaks and valleys will be noted, and frequently with the result that the means for correcting such fluctuations will be readily apparent. If branch offices are maintained, or products of a diversified nature are marketed, sales comparisons, continued over a period of time, will automatically suggest changes in product or alterations in policy. From such analyses, betterment in general business is the inevitable result.

Statistical analyses are so valuable and rich in opportunity that no business, even though small, can afford to ignore them. In large enterprises they have assisted intelligent control for years. Employed proportionately, they will do the same for small concerns.

"We Moderns"

WHOLE books, long reels and short stories without number have recounted and retold the thrilling adventures of the pioneer gold seekers, and the perils of the stampedes of claim seekers in various mining districts the world over. That any such gold rush calls forth the last ounce of courage and imposes the demand for supreme effort on the part of every participant, we have been abundantly assured. Furthermore, according to story, the race is always to the swift.

If the race is to the swift, there will be a different class of "pioneer" win in the present Canadian gold rush. The latest objective of a placer rush is a point southwest of Porcupine, in northern Ontario. But instead of laborious travel with slow-moving dog teams or pack mules, claim seekers are being transported by airplane. Commercial aviation companies, sensing gold in the transportation business rather than in the raw state, have availed themselves of this opportunity to do a thriving passenger business. Incidentally, claims yielding as much as $8 a yard are said to have been staked.



Picture taken at the Seventh annual banquet of the American Pulp & Paper Mill Superintendents Association, June 3, 1926, at the Book-Cadillac Hotel, Detroit, Michigan

Superintendents Meet at Detroit

At Seventh Annual Convention, June 3, 4, and 5, Attendance Is Large with Papers and Discussions of Great Interest and Value

THE choice of Detroit as the meeting place for the seventh annual convention of the American Pulp and Paper Mill Superintendents' Association was well justified by the results, as the attendance and interest displayed exceeded that of any previous meeting. Both the business and social features of the convention were exceedingly engrossing but enjoyable, thanks to the work of the committee of arrangements under the direction of William F. McGraw, chairman, whose admirable services were recognized by a standing vote of the association. The management of the Book-Cadillac Hotel contributed greatly to the success of the meeting, nothing but praise being heard for the efforts put forth to insure the comfort and pleasure of all in attendance. The program was a little crowded at times and it was necessary to curtail some of the papers at the final sitting on Saturday, but the program as printed was generally followed and every member and visitor who was down for a paper or discussion had an opportunity to be heard. It was unfortunate that a greater amount of time could not be given to the discussion of white water recovery and stream purification, but it is planned to issue a special pamphlet containing the papers as printed, which will include written as well as oral discussions. A complete new board of officers was chosen, only the secretary and treasurer being re-elected, and the association will go south next year, Richmond, Va., being named the convention city for 1927.

THURSDAY'S SITTINGS

The opening sitting on Thursday morning, June 3, which was a little late in getting under way, was attended by upwards of 250 members and visitors.

President's Message

Following the introductory remarks by Chairman McGraw, President Coughlin gave an account of the steps leading to the choice of Detroit as the Convention City. Although not a paper city, there were industrial attractions in Detroit that were worth coming a distance to see. Mass production operations could be witnessed on a great scale. These constituted the fundamentals of the marvelous growth and continued success of the automotive industry. Mr. Coughlin said that the index of activity of this industry might well be taken as the direct index of the paper industry. The convention committee had worked out in detail trips of inspection that would be of great interest and of informing value.

Touching upon the activities of the association during the past year, he mentioned white water recovery, vocational training, development of chemical and mechanical pulp divisions, and co-operation with the Technical and Cost Associations in developing standards of operation.

He called special attention to the work of the White Water Waste Committee under Chairman Server and besought the advice and counsel of the members in discussing the data which would be presented by him. By reclaiming fibers from white water, stream pollution would be prevented and great savings effected. The problem had now assumed a different aspect on account of legislation contemplated by States that contained papermaking areas.

The development of the association through the organization of local divisions was mentioned with pride and satisfaction. It was the aim of the Superintendents' Association, he said, to form a division in every paper making center of the United States and Canada. The association had established itself so well that it was no longer necessary to make drives for new members. The present membership amounted to about 600. The task before the officers and members was to keep the association functioning and thriving and to lay out a policy to insure future growth whereby something definite could be accomplished each year that would merit the continued interest of the membership and more especially the mills represented by members.

He paid tribute to the work of the friends of the association and especially commented on the diligence of Secretary Eminger as shown in the 1926 year book, his "latest creation," which was full of valuable data and represented a year's hard work.

William F. McGraw, sales manager of the Detroit district of the Gutta Percha and Rubber Company, of Buffalo, N. Y., who served as the able, courteous and efficient general manager of the committee on arrangements for the Detroit meeting, was especially commended for the results achieved by him in assuring a successful convention.

After President Coughlin had announced the losses by death during the year, he called on the Rev. Peter Stair, of Detroit, to invoke the Divine blessing on the proceedings, which was done with becoming reverence, all joining in reciting the Lord's Prayer. He then introduced Commissioner of Purchases, J. E. Mills, of the Detroit City Government, who welcomed the visitors on behalf of Mayor Smith, who was prevented by illness from attending. Mr. Mills gave a brief account of the growth and development of Detroit and spoke of its advantages as a convention city, sounding its slogan as "Dynamic Detroit." It was particularly appropriate, he said, that Detroit should have been selected as the place for exchanging views on ways and means for developing a great industry, seeing that it was so convenient to the paper-making centers of Kalamazoo and Monroe, and he expressed the hope that this convention would be the best of the series, which it did, indeed, turn out to be.

Response by Mr. Slater

The response for the association was made in eloquent fashion by Joseph H. Slater, of the Escanaba Paper Company, who said that in selecting Detroit as a place of meeting the association had been impressed by the enterprise and development of the city which had earned for it the title "Dynamic Detroit."

Following the delivery of his annual Message, in which he interpolated a reference to the action of the National Stream Purification Committee for the Pulp and Paper Industry looking to the appointment of an engineer under the American Paper and Pulp Association, with the co-operation of the Mill Supply and Equipment Association, President Coughlin announced the appointment of committees on audit, resolutions and nominations. The Committee on Nominations, consisting of the full executive committee and three past presidents of the association, was instructed to meet at the close of the banquet in the evening and to be ready to report next morning with a slate for officers to serve during the ensuing year.

Cultivating Co-operation in an Organization

John S. Schumaker, of Lincoln, N. H., who had previously addressed the superintendents on "Humanics and Organization Development," and had been urged by Secretary Eminger to enlarge on the theme with a supplementary paper for the Detroit meeting, was then called upon.

A telegram was read from John S. Schumaker regretting his inability to attend and asking Nelson R. Davis to present his paper, which was accordingly done.

Getting the Confidence of the Men.—Mr. Schumaker touched on the importance of foremen getting the confidence of the men under them. If this was done little concern need be felt about developing confidence in the men higher up, as this would follow naturally. He gave a number of suggestions for the cultivation of better relations with subordinates. Thus,

if one of the workers comes to an executive with an idea which is seen to be fallacious as soon as it is developed, it would not be good policy to say, "No, John, that idea is no good," or "Oh, that's been tried a dozen times and won't work." Better say, "That sounds like a good idea, John. How do you think it would work under such and such conditions?" By putting the question this way John is given a key to the ineffectiveness of his idea and will himself turn it down, at the same time thinking kindly of the manager and be undeterred from bringing another idea to him when he feels he has one.

Let the Foreman Do It.—As a suggestion for executives he said that when a man is to be promoted the foreman should do the promoting. Likewise when in the maintenance of discipline it is necessary for a man to be discharged or released from an organization, his foreman should be the one to do it.

In every case where a man is to be discharged, the discharge should be preceded by a period of suspension. This would save a foreman from hasty action that might later be difficult to correct.

Playing the Game.—Mr. Schumaker advised giving employees as many pertinent facts about the business as could consistently be given, but not to give any unless they are presented in such a way as to meet the mental development of the man and be thoroughly understood and appreciated. This, Mr. Schumaker said, was playing fair with good faith and it was necessary for an organization to set up fair and just rules for playing the game. The men will play the game of manufacturing and suffer hardships if necessary when they know the game is being played fair and square according to the rules.

Loyalty and Goodwill.—Mutual confidence brings loyalty and goodwill. The value of the goodwill of an organization could not be placed too high and thought should be given to gaining and holding it. Organizational goodwill cannot be purchased, but can be won by the exercise of patience, modesty, self-denial, sympathy, confidence, justice, good faith, tact, and loyalty. What the employee needed most to know was his relation to the game and if the rules were being lived up to fair and square by everyone.

Major Departments.—The three major departments of an organization were stated as (1) Administrative, (2) Manufacturing and (3) Sales. For the paper industry, manufacturing is placed before sales, as at the outset one has to determine whether one is going to sell what is made, or make what is sold. The answer to this determines the supremacy of the sales department over the manufacturing, or vice versa. He gave several instances of business dealing to show the effect of confidence and co-operation and why it was important to determine what the policy of the organization should be—whether to "sell what you make" or "make what you sell." He sketched the organization of a pulp and paper mill making two kinds of pulp and several kinds of paper and the "humanic" fitness of the heads of departments. The general manager should have supreme ability to practice humanics for his business is to co-ordinate, guide and lead the entire organization.

The kind of organization, or rather its form, affects the degree to which humanics can be applied, and the right kind of conferences were particularly helpful. He described an instance of the wrong kind of conference. The application of humanics was essential for satisfactory conferences.

Mr. Schumaker's interpretation of the word humanics is: "A mode of conduct with and toward one's fellow man that begets the maximum of co-operative and enjoyable relationship." In bringing his paper to a close he said that humanics and its proper application in industry was rapidly becoming an active and potent factor, and it might be imperative to appoint someone whose sole duty should be the direction of the humanics of an organization—not a labor agent, "who by his cunning can outwit and defeat the ambitions of the labor body," but one whose task it would be to make labor understand and have confidence and loyalty in and to the institution.

A meeting of the board division and visits to mills in Monroe had been arranged for the noon hour on Thursday and President Coughlin asked all who intended leaving at 11:30 to stand up. Forty members responded and left the hall before the discussion of Mr. Schumaker's paper took place.

Discussion of Humanics

The discussion was opened by Mr. Coughlin, who spoke of the benefits of mill conferences. In starting conferences of mill foremen at a plant which he had only recently been connected with, he had at first experienced difficulty in developing interest on the part of some of the older men who had been employed at the mill for periods ranging from twenty-five to forty years. But once their interest was aroused all was smooth sailing. Weekly meetings had been held for a year and a half. Every foreman had now a better grasp of his duties and the men had developed greater interest in their work.

Advantages of Getting Together

Nelson R. Davis said that at the S. D. Warren Company's plant some seventy foremen and department heads get together every three months for a meal and a social time and at these gatherings views were interchanged for the benefit of all, a finer spirit of co-operation being engendered in this way.

Fred J. Rooney said there was sometimes embarrassment at foremen conferences on account of the excessive amount of suggestions brought out. Many of these were impossible of adoption and it required the exercise of considerable tact to satisfy everybody and maintain pleasant relations. The idea of suspending a man before discharging him as advocated by Mr. Schumaker, was a good one, he said.

The Man with Ideas

Mr. Slater believed in individuality. Every successful business man was the shadow of one or two other men. Mussolini in Italy showed how one man with ideas could lead others. At mill conferences a lot of impracticable suggestions were often made, but it would not do to turn down ruthlessly any man's suggestions. Diplomacy must be used. As for the foreman in his relations with the men, he should always assume a just and friendly attitude.

A Paper for Mill Managers

Tom Harvey thought Schumaker's paper should have been read to mill managers and not to mill superintendents, who only take orders from the managers. In his own case conditions were unique. He knew of no other organization like the Gardner-Harvey Company, where the three Gardner boys leave the actual operation of the mills to himself and his brother George. Last year, George went to Europe and took a moving picture camera with him. On his return, at a big dinner of the plant operatives he showed moving pictures of the places visited by him. The relations of the executives with the workers at the Gardner-Harvey mills were unusually intimate and agreeable and numerous were the means employed to take care of employees, among others the operation of a Mutual Benefit Association by the workers themselves and employees' insurance which covers every man in the mill in amounts from $1,000 to $5,000. On June 25, the mills will be shut down and all workers will be taken to an amusement park in Cincinnati for a day's outing at the expense of the company. Emphasizing the intimacy of their relations, Mr. Harvey said:

"We are in business to make money and to make men. It conduces to a happy feeling when the worker knows he can go to his employer and tell his troubles. The time has come, however, when it is necessary to see that our men are happy and contented, and to give more time to doing so than to keeping our mechanical tools and machinery in good shape. In other words, think more of your men than of machinery."

Charles H. Kephart, of the York Haven Paper Company, spoke of the foremen's meetings held monthly at that mill, where it is a standing rule that every foreman bring back to the men under him an account of the discussion at the foremen's meeting. He mentioned some of the things that had been done by the company in the interests of the men, one example being the endowment and maintenance of a library in a separate building at a cost of $85,000.

It took a long time before the interest and confidence of the men could be developed, but the effort was worth while. Mr. Kephart said that in his opinion there were some points in

Mr. Schumaker's paper that needed modification. He thought there was need for co-operation between the manufacturing superintendent and the purchasing superintendent. The superintendent of the paper mill should feel able to go to the superintendent of the sulphite mill and say to him, "I want the pulp made in such and such a way for my purpose," depending on the grade of paper to be run on the machine.

After announcements concerning division meetings of book and fine paper superintendents and chemical pulp superintendents for the afternoon, Nelson R. Davis was asked to read a paper by Dr. Hugh P. Baker, in the latters' absence, which he accordingly did.

Our Future Wood Supply

The text taken by Dr. Baker was "The Future of the Wood Supply for the Paper Industry." The paper began with a reference to the developing use of wood in the paper industry, an industry which was unique among the industries of the country in witnessing within a human generation almost a complete change in the character of its raw material. Of the 700 to 800 active paper mills, he said that one might count upon the fingers of one hand the number which were not using wood more or less as a raw material. Statistics were given of the consumption of wood in paper manufacture. The million cord mark was passed in 1890. In 1924 there was produced 4,488,107 cords and 1,279,975 cords were imported. The consumption of pulpwood in 1925 amounted to 5,840,000, an increase of slightly more than 1 per cent over 1924.

The annual cut of pulpwood in the United States was only about 4 per cent of the total annual cut of wood for all purposes, Dr. Baker said.

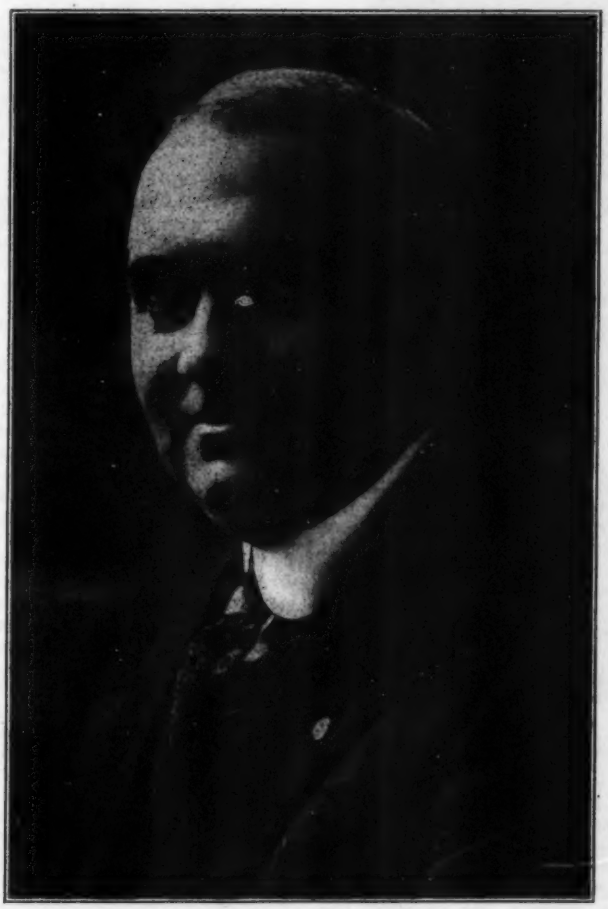
Mistaken Notions About Wood Papers.—There was much of general interest in Dr. Baker's paper, as where he commented on the mistaken notion entertained by some people that papers made from wood must be coarser or cheaper than those produced from other fibers. He pointed out that there was no sound basis, from a technical standpoint, for this belief, and that it was now possible to make paper from wood-pulp equal in character to that produced from other fibers.

Character of fiber had much to do with the choice of woods. Spruce was most commonly used, with balsam fir and hemlock later in request and finally the growing pines of the North and the South, and the softwoods of the Pacific Coast.

The work of the American Paper and Pulp Association in making reconaissance surveys of the different pulpwood producing sections by the employment of a forester attached to the Woodlands Section of the association was instanced in Dr. Baker's address as one of the means of assistance to the industry along forest management and utilization lines.

New Sources of Pulp.—New and unused species of timber adapted for pulping were mentioned, as for instance, the tulip poplar of the middle south, the ailanthus (Tree of Heaven), and the maidenhair tree of Japan, which last mentioned is a broad-leaved diciduous conifer. Forestry was the crux of the problem of fortifying the paper industry with a permanent supply of satisfactory wood. Effective protection from fire constituted 50 per cent of the problem of maintaining forest productivity.

Tax Reforms Needed.—Of great importance in reaching a condition favorable to the growing of forests, particularly by the private owner, was the changing of destructive forest tax laws into constructive measures. Some of the States are beginning to see the advantage of taxing forest lands as are agricultural lands. A low land or soil tax similar to that put upon barren or idle lands, with a yield tax at the time the forest is cut, would accomplish more for the practice of forestry than any other single movement, Dr. Baker said.



President Fred J. Rooney

Definition of Forestry.—The practice of forestry was defined as "a businesslike handling of forest lands so as to secure the most practical continuous productivity of those lands." To the man in the street, forestry means tree planting only, but it should be made clear that tree planting is in fact only an incident in forestry. A beginning in forestry is made whenever a timberland owner starts to protect his forests or forest lands from fire and begins cutting in such a way as to assist the forest in bringing on a second growth of timber.

It is only within the past six or eight years, said Dr. Baker, that the paper industry has come to a full recognition of the fact that the industry is really a wood-using industry, and that the basic raw material must continue to be wood. The constant drive of the American Paper and Pulp Association for a better understanding of the wood supply problem and of forestry had increased the interest of the industry in the whole question of a permanent wood supply.

Vice President Stafford Ill

Before taking up the discussion of Dr. Baker's paper, it was announced from the platform that Vice President Homer E. Stafford, of Kalamazoo, was seriously ill and had been removed to a hospital for an operation, an announcement that was received with genuine sorrow by every superintendent in the hall, Mr. Stafford being universally well liked and popular.

Discussion of Dr. Baker's Paper

Joseph H. Slater was the first to discuss the paper. He reminded those present of the action taken by the Superintendents' Association last year in voting an appropriation of $500 for the support of the Woodlands Section of the American Paper and Pulp Association. He had talked with Dr. Baker about the work of the Woodlands Section and was convinced that the money had been well spent. In regard to the reference in Dr. Baker's paper to taxation relief, he called attention to the Foster bill in the New York legislature which would relieve land in process of reforesting from excessive taxation. He drew a depressing picture of woodland conditions in the United States after the lands had been

denuded of all growing timber and the raw material of paper-making had been exhausted.

Maine Mills Buying Farmland

Nelson R. Davis discussed the likelihood of a Canadian Embargo on timber exportations. In Maine the mill owners had begun to buy up abandoned farms and plant trees on

William F. McGraw
Chairman Convention Committee

them. In this way, it would be possible to tide over a period prior to the purchase of wood from Poland and Russia some ten years hence.

Peter J. Massey said that the Wm. Hall Printing Company had also begun the purchase of forest lands in the state of Maine in order to protect its interests. He suggested the purchase of lands by the association through its members who would buy shares at $10 each with the assurance of getting their money back at the end of twenty years.

Correct Forestry Talk

Mr. Slater returned to the subject by saying that the people who are talking forestry do not talk it the right way. The citizens of Michigan were confronted with the prospect of increased taxation on account of the denudation of timber tracts making them unproductive and so causing new taxation to raise revenue. He counselled constant hammering on the subject till an impression was made.

THURSDAY AFTERNOON SITTING

The afternoon of Thursday was occupied with three divisional meetings, one for the Book and Fine Paper superintendents, one for the Chemical Pulp superintendents and one for the superintendents of board mills, the last named being held at St. Paul's M. E. Church Hall, Monroe, Mich.

Carl Magnus, of the Standard Paper Manufacturing Company, Richmond, Va., presided at the meeting of the Book and Fine Writings Division which was called to order at 2:30 P. M. In an address to the members, Mr. Magnus expressed his gratification at the growth and development of the association. The Superintendents' Association had come into existence, he said, to supply a definite need—the need for an agency which would serve as a common ground for co-operative effort in the discussion and solution of technical problems of production and management common to the industry. The association was being carefully observed from many points and judgment would be rendered according to its accomplishments.

Overproduction Exists.

Mr. Magnus called attention to some conditions in the industry which were becoming increasingly important. For one thing, he said, the industry has been expanding in productive capacity far beyond the limit of normal demand, and he asked if it was not possible that a mistake was being made in assuming that additional machines and increased productive capacity necessarily resulted in decreased overhead, lower unit costs and greater profits. Was it not more likely that the answer to lower costs and better profits lay not in more machines and multiplied capital investment, but rather in the modernizing and more efficient use of available equipment, together with the elimination of waste and a more intelligent sales effort.

For Attention of Sales Managers

Many grades of paper were being marketed at prices which bore no sound or real relation to cost of manufacture. This was due not only to overproduction, but to a state of mind on the part of the paper-purchasing public which led it to think it could purchase paper at its own price. Mr. Magnus said that this was a statement that many sales managers might challenge in public but yet admit in private.

The condition pointed out by Mr. Magnus had been met, he said, in other industries by campaigns of education to present in an interesting way the true facts about their particular industry to the buying public. The paper-buying public, particularly the publisher, printers, paper jobbers, and the large direct consumers of paper in the United States should be given the facts concerning the immense and necessary capital investments at stake, the average nominal return on this investment, or the more frequent red ink figures.

Educate the Public

Mr. Magnus said that the paper-buying public needed to know more about the paper industry, about the great risks involved, the technical skill and practical experience required, and as compared with their own industries, the prevailing low rates of remuneration paid for this skill.

And to back up the needs thus set forth, it was necessary that there be more mills with the courage to stick to a price that they know is mutually fair.

These figures and timely remarks by Mr. Magnus brought Nelson R. Davis to his feet with the declaration that he hoped every sales manager would read and profit by them.

The reading of papers was then taken up.

Devices That Displace Decklestraps

S. Carroll Wentz, of P. H. Glatfelter Company, is the inventor of a mechanical device to take the place of rubber decklestraps in the operation of the Fourdrinier machine. This consists of an edge ruler having a rubber feather which is carried on short brass shafts mounted in supports secured to the side rails of a Fourdrinier paper machine. When deckle changes are necessary, the edge ruler is slid in or out by hand on these short brass shafts. He stated that there was a 20 to 50 per cent saving in the cost of wires with the use of this device and an ability to get a wider sheet.

Mr. Wentz described a number of contrivances that had been used as substitutes for rubber deckle straps. The original idea was to be found, he said, in the invention of a Norwegian, the principle of using an edge ruler against the wire being embodied in it. But a shower pipe was also part of the patent and this is done away with in the Wentz patent which consists of a triangular brass bar and a special clamping device to hold the rubber strip or edge ruler in correct apposition to the wire. The rubber strip tapers from the apron to the end of the brass bar, being about an inch wide at the slice and tapering down to a thin feather which

faintly impinges the wire at the other end of the brass bar. No water spray is used to assist in forming the edge. The foregoing applies to the use of the Wentz device on old machines equipped with the usual deckle frames and one or two slices. When used with a Voith inlet the rubber strip and brass bar extend far enough back to allow the apron of the inlet to rest on it.

Mr. Wentz asserts that with his device it is possible to get from two-and-a-half to four inches more in width of the sheet over the machine. He gave examples of this from his own experience at his mill in Spring Grove, Pa.

Remanufacture of Old Papers

The title of Alfred Bryant's paper was "Methods of Deinking Old Papers." After a reference to the sorting and grading of old papers, to keep back groundwood stock, highly-colored material and bookbindings, he described one of the earlier methods of cooking old papers with the use of a vomiting boiler. This was a circular tank having a perforated false bottom and a percolator spout passing up through the center of the tank partly filled with a solution of soda ash. The hot liquor was kept spraying over the charge of papers in the tank for a definite period, or until the papers were sufficiently cleaned and softened to permit of being forked out by hand after the false bottom had been removed and the excess liquor drained off. The drawbacks of this method were concerned with the difficulty in making the soda solution penetrate to all parts of the material and the general sloppiness and dirt connected with it. Uncooked paper sometimes make its appearance in the finished sheet where discolored blocks and original printed letters would be found.

Rotary and globe cookers were an improvement as a constantly moving mass of pulp and liquor was thereby secured; less soda ash was needed to cut the inks, colors and sizing. Mr. Bryant mentioned the Winestock system in which rapid circulation of the stock is obtained by the use of a power-driven propeller. He also spoke of the Billingham method which defibers the stock by discharging it in two opposing streams each striking the other. The cooking is done in a closed beater where the roll does the work of circulating and defibering with high-pressure steam. The latter method has certain disadvantages, one of which is that the stock is apt to lie on the bottom of the beater and uncooked papers may result.

A method of treating old papers which provides a mechanical process of feeding the stock into a series of horizontal tanks with inclined bottoms was referred to as the "high-density low-pressure method." After being dragged forward mechanically while immersed in soda ash liquor, the mass is passed through rolls which squeezes out most of the liquor. The stock is then defibered and passed over a series of decker-type washers. A more recent system employing a Shartle beater pulps the old papers by means of water at a temperature of 160° Fahr. The stock is passed continuously as pulped into large horizontal cooking tanks hooked up to a high-speed centrifugal pump which defibers and circulates the stock, which is then led over decker washers. The advantage of this method is that it is possible to bleach with a low chlorine consumption and less waste of wash water.

Mr. Bryant said that the aim in all good remanufacturing processes was to eliminate waste and recover as near to 1 lb. of new paper from 1 lb. of old paper as was possible.

Cooking Time and Pressure for Old Papers

Several of the superintendents inquired as to the proper temperature and pressure at which to cook old papers in a rotary boiler, without getting definite figures in reply, though it was generally agreed that a pressure of 25 lbs. was too high, decomposition and blackening of the pulp taking place when 25 lbs. or higher pressure was reached.

Simple Explanation of pH Value

Dr. W. A. Taylor has made the subject of hydrogen ion controls so much his own that he is able to give a popular lecture on it, a feat that is attended with some difficulty, as all chemists know. In the paper entitled "The A B C of Hydrogen Ion Control in Paper Manufacture," the president of the LaMotte Chemical Products Company, Baltimore, compared the pH scale in acidimetric work with the scale of Fahrenheit for indicating temperature. On this scale 32° represents the freezing point of water. Any values higher than 32°, such as 34°, 36°, 40°, etc., denote an increase in heat, the degree of heat increasing as the numbers increase. On the other hand, any values below 32°, such as 30°, 28°, 20°, etc., denote an increase in coldness, the degree of coldness increasing as the numbers decrease. It is apparent that it is not necessary for a person to know the derivation of the term "degree Fahrenheit" in order to determine the temperature of a solution.

In an exactly similar manner the degree of acidity or alkalinity is expressed by a hydrogen ion (pH) scale. Instead of being expressed as degrees, as in the case of the thermometer, the units on this scale ahe called pH values. The meaning of the term "pH" is immaterial for the use of this method of measuring acidity and alkalinity. On this scale a value of pH 7.0 represent neutrality. This means that if the material being tested has a pH value of 7.0 it is neither acid nor alkaline.

Following the illustration of the thermometer given above, any values higher than pH 7.0, such as pH 7.2, 7.4, 8.0, 9.0, etc., denote alkalinity, the degree of alkalinity increasing as the numbers increase. Analogously, any values lower than pH 7.0, such as 6.8, 6.6, 6.0, 4.0, 2.0, etc., denote acidity, the degree of acidity increasing as the numbers decrease.

Dr. Taylor made the illustration even more lucid by giving a concrete example. Supposing that a solution has a pH value of 7.6. The solution is of course slightly alkaline and it is necessary to add a definite quantity of acid to it in order to bring it to the neutral point of pH 7.0, and larger quantities of acid to bring the solution to an acidity of 6.8, 6.0, etc. Similarly, if a solution has a pH value of 6.0 it is acid, and it is necessary to add alkali to it in order to bring it to the neutral point of pH 7.0, or to an alkaline value such as pH 8.0.

In this way it was shown that it was necessary only for the operator to know what pH value should be maintained in a given operation and how to determine when sufficient acid or alkali has been added to obtain this value.

He then described the method developed by the LaMotte Chemical Products Company for making hydrogen ion measurements by the use of color standards with the H-Ion Roulette Comparator. The principle of hydrogen ion measurements depends on the fact that various indicators give changes in color with changes in acidity or alkalinity. Thus if litmus paper is dipped into a solution and the paper turns red, we know the solution is acid. If, on the other hand, the litmus paper turns blue, the solution is alkaline. But this is a crude method of measurement, as litmus paper is very insensitive and gives no definite idea of the exact degree of acidity or alkalinity. With an indicator like bromthymol blue the pH scale from 6.0 to 7.6 can be covered. If a small amount of a solution of this indicator is added to a solution which it is desired to test the color obtained will indicate whether the solution is acid or alkaline. If a yellow color develops the solution is acid and if blue it is alkaline. If, however, an intermediate color is obtained, the solution is either neutral or very slightly acid or alkaline. It is then a question of determining the exact degree of acidity or alkalinity, and this is where the color standards, or LaMotte H-Ion Block Comparator, comes in.

A set of color standards for bromthymol blue consists of nine standard tubes each of which is marked with different pH values in intervals of 0.2 pH. The tube marked pH 6.0 has a yellow color, and that marked pH 7.6 a deep blue color, the tubes between these extremes showing intermediate colors. In testing, one of the test tubes is filled to a mark with the solution to be tested and a definite amount of bromthymol blue indicator solution added. The color produced is compared with one of the color standards and the degree of acidity or alkalinity read off directly from the tube with which it matches.

The foregoing is the briefest outline of a most interesting lecture in which Dr. Taylor gave the fullest details of the equipment for and method of measuring pH values. The applications of the method to operations in paper manufacture were described, beginning with the control of acidity in engine sizing so as to avoid the excessive use of alum. Dr. Taylor said that by hydrogen ion control and only by this method was it possible to determine just when the proper amount of alum had been added so that sizing would be satisfactorily precipitated and no alum wasted. Some mills

maintain their beaters at a pH value of about 4.7, but this was a point, he said, which was best determined by the individual plant, as it might vary somewhat under different conditions.

Doctor Taylor exhibited the LaMotte H-Ion Roulette Comparator and conducted simple tests with the color standards to show the ease and rapidity with which the pH value of a pulp or solution of any kind could be determined. In reply to an inquiry he gave the price of the set as $75. J. H. Slater said the instrument had been used successfully in the mill of the Escanaba Paper Company and savings had been effected by its use.

Training of Foremen and Workers

The methods employed at the mill of the Champion Fibre Company, Canton, N. C., in the training of foremen were described and illustrated in a paper by J. Norman Spawn, educational director of the company. The responsibilities of foremen were listed on wall charts, together with a number of other problems and tasks used in classroom work. It was amusing to note the values placed upon the different responsibilities by the foremen. They were asked to place a value of 10 upon the most important and a value of 1 upon the least important of the responsibilities enumerated, which include "Safety," "Co-operation," "Making Reports," "Hiring and Firing," "Know Your Job," etc. Invariably the foreman student would give a value of 1 to the subject of Making Reports, 10 to Know Your Job, and so on. Under Giving Orders, the points to be borne in mind in framing an order were illustrated on the blackboard as follows:

What is to be done;
Who is to do it;
When it is to be done;
Where it is to be done;
How it is to be done;
Why it is to be done.

Mr. Spawn gave a little preachment on co-operation which he defined and illustrated by sketches. He showed that there was no co-operation between two men unless each was willing to approach each other more than half way and that good co-operation resulted when each fellow went nine-tenths of the way.

PULP SUPERINTENDENTS' MEETING

Benjamin T. Larrabee presided at the divisional meeting of the pulp superintendents where he had a select audience to discuss his own paper on "Problems Connected with the Manufacture of Sulphite Pulp" and the paper by August F. Richter on "Digester Bricks."

Problems of Pulp Mill Superintendents

In a paper of unusual interest and value, Benjamin T. Larrabee, of the S. D. Warren Company, Cumberland Mills, Me., advocated a special meeting of pulp mill superintendents to be held in 1927. Mr. Larrabee has had a feeling for some time that the mechanical and chemical pulp men of the association should perfect an organization for definite constructive work. Pulp mill superintendents were confronted from time to time with bothersome problems which might be cleared up in a divisional meeting. He also advocated the appointment of four committees, representing each grade of pulp, to take care of local problems as well as new processes and developments.

Mr. Larrabee called attention to Bulletin 1,298 of the United States Department of Agriculture on "Control of Decay in Pulp and Pulp Wood," and quoted extracts from it. He recommended that groundwood superintendents provide themselves with a copy of the complete report for reading and study.

In connection with this report on the deterioration of wood by molds and wood-destroying fungi where it was shown by analyses of sulphite pulp from sound and badly decayed woods how the quality of the pulp is affected when the wood is decayed, he called attention to the paper by Dr. Th. Bentzen, chief chemist of the Whiting-Plover Paper Company, Stevens Point, Wis., as presented in the March issue of THE PAPER INDUSTRY, and quoted Doctor Bentzen's descriptions of alpha, beta and gamma celluloses.

Mr. Larrabee expressed it as his conviction that eighteen months should be the maximum life of the wood from the forest to the pulp maker. To make a good grade of sulphite it was important and necessary to protect the wood from decay, to control the moisture as well as the size of the chip, and other details.

The control of burner gases in relation to finished pulp was considered. He mentioned three methods of control—intermittent and continuous determination of the SO_2 and by means of a pyrometer. If, as has been stated, there is a direct relation between the percentage of SO_2 and temperature, a recording pyrometer should insure perfect control.

The method of determining the completion of a cook was touched upon by Mr. Larrabee. There must be an ideal or standard method that is the best and he believed a general discussion of this point by the sulphite superintendents would be serviceable in bringing it out. He suggested the collection of samples of stock from the digester during the latter stages of the cook and the application of a chemical or physical test to determine the blowing point. He wondered if a freeness test would be of any value.

The use of a shallow riffler and the necessity for standardizing this equipment were mentioned. He considered the use of a riffler essential and necessary in the production of a clean, high-grade sulphite pulp.

Among those present who discussed the paper were G. J. Armbruster, Fraser Companies, Ltd., Edmundston, N. B.; Michael J. Argy, Cliff Paper Company, Niagara Falls, N. Y.; J. E. Blosser, Scott Paper Company, Chester, Pa.; John A. Bowers, Hammermill Paper Company, Erie, Pa.; Fred C. Boyce, Wausau Paper Mills Company, Brokaw, Wis.; Thomas L. Dunbar, Stebbins Engineering & Manufacturing Company, Watertown, N. Y.; Arthur S. Cosler, Texas Gulf Sulphur Company, Chicago; P. J. Lamoureux, Marinette & Menominee Paper Company, Marinette, Wis.; W. A. Monro, Munising Paper Company, Munising, Mich.; A. J. Natwick, Lincoln Pulp & Paper Company, Ltd., Merritton, Ont.; W. A. Pitts, York Haven Paper Company, York Haven, Pa.; W. M. Osborne, Newton Falls Paper Company, Newton Falls, N. Y.; H. A. Skinner, Marathon Paper Mills, Rothschild, Wis.; P. J. Sievert, Marinette & Menominee Paper Company, Marinette, Wis.; A. G. Stone, Marinette & Menominee Paper Company, Marinette, Wis.

When to Blow Digesters

One of the most interesting subjects discussed was the correct pressure at which to blow digesters. It was generally agreed that it was best to blow the digester at as low a pressure as possible, but at the same time blow it clear. There were advocates of blowing at high pressures against a target for the purpose of disintegrating the fibers more completely, though it was stated that by doing so the fibers would be broken up and shortened.

The time for bringing a digester to pressure in relation to the penetration period was discussed and various opinions expressed on this as well as on the cooking period and the effect of slow and quick cooks on yield and strength. The cooking time determined the quality of pulp and the resulting paper, short cooks often giving a paper lacking in strength. It appeared to be the consensus that a cook of at least ten hours was the most satisfactory practice.

Best to Use Green Wood

Fred C. Boyce believes in cooking greenwood and most of the superintendents agreed with him, though some did not hesitate to say that they got the highest yield of pulp from seasoned wood. A. J. Armbruster reported a falling off in yield amounting to 7 per cent with wood that had been stored in the yard one year as compared with wood which was used immediately. Nobody was found to dissent from the statement that wood should not be kept longer than eighteen months from forest to digester. The cooking of green wood required special knowledge of cooking conditions.

Sme interesting points were brought out concerning the reclamation of fibers from the wash water after the digester was blown, a saving of 90 per cent of fibers by the use of savealls being reported in one instance. The use of coconut matting over the bottom of the blowpit was reported to be a useful device in the saving of fibers.

Use of Recording Pyrometers

In the burning of sulphur the use of a recording pyrometer was advocated. The advantages of the SO_2 regulator were

compared with the use of the recording pyrometer and the discussion developed the fact that there was a direct relationship between the percentage of SO_2 and the temperature as recorded by the pyrometer.

Brick Digester Linings

In the paper by August F. Richter on "Digester Bricks," the experiments of H. W. Stebbins in the moulding of bricks from various materials were described. He showed that the commonly accepted belief that bricks made from any clay were capable of resisting the action of sulphite liquor had no basis in fact, and said that some disastrous results had followed the use of clays without regard to the influence on them of high temperature and pressure, two forces which were more destructive to digester linings than either cooking liquor or the application of direct fired heat.

After testing moulded bricks from clay and cement compositions and subjecting them to heat treatment, a record of the calipered length before applying heat was kept and checked against the length recorded for the heated piece. Remarkable variations were observed. The test was then applied to pieces of steel digester shell, of the same length as the pieces of brick, so as to compare the relative expansion of different clay products, of cement and of steel. The coefficient of expansion for steel was determined by this method to be greater than for a semiporous brick at the same temperature. It was easy then to develop a brick and type of lining which would reduce the radiation of heat to the digester shell and at the same time expand in unison with the shell, the fact being taken into account that the shell is cooler than the lining during the process of cooking.

The Stebbins Engineering Company made digester bricks from a mixture of selected clays in which hard flint, or so-called silica, clay is mixed with softer clays. After being wetted the mass is hand-moulded and dried on a heated drying floor. When properly dried the bricks are kilnfired at a gradually increasing temperature, up to 2,600° Fahr., an operation which takes nine to ten days, after which they are slowly cooled before opening the kiln, so that the entire process takes about twenty-four days to complete.

In the discussion which followed the fact was brought out that greater tonnage capacity might be obtained by lessening the thickness of the digester lining, any tendency to increased steam consumption being obviated by the use of asbestos as an outside covering for the digester. It was estimated that with a 10-ton digester, a decrease in thickness of lining from 7½ to 5¾ inches would increase the capacity of the digester by 400 lbs. However, in the case of very large digesters, a strong and thick lining should be maintained, on account of the increased strain on such digesters.

BOARD MEETING AT MONROE

Control—"know what you are doing"—the theme of a talk by Tom Harvey, of the Gardner-Harvey Paper Company, and some very interesting exchanges of professional opinion between the members of the division featured the meeting of the board section of the American Pulp and Paper Mill Superintendents' Association held in Monroe, Michigan, on the first day of the annual convention, Thursday, June 3. A very large party of superintendents and equipment men enjoyed the splendid collation served by the ladies of the St. Paul's Methodist Episcopal Church of Monroe. Later the members of the group visited the board mills of the city under the guidance of the various superintendents connected with the mills.

The formal paper provided by Mr. Harvey was prepared on short notice but Mr. Harvey's familiarity with the topic made it possible for him to do an especially thorough job. H. G. Funsett led the round table discussion which covered such topics as "killing foam, "overcoming checking," "the best kind of lime for cooking." Lloyd T. Murphy, chairman, Western board section of the association, presided.

Mr. Harvey emphasized in his talk the necessity of measuring the results of every paper mill process as far as is possible and of having means of recording these measurements. He pointed out, first that there would be definite facts to study for purposes of making improvements in the process. Second, there would be a constant check on the performance of the machine operators—not dependent on what they wrote down as their guess as to what they had done but a clearly recorded story on a chart made by a good instrument on which inquiries as to why certain things had not been done or had been done could be based. Third, there would be a record on which to base investigations of the complaints of customers that the board was not as ordered. Fourth, and this point was emphasized, from the recording instruments might be developed controlling instruments which would automatically correct improper conditions as the product was being made and turn it out right at the end of the machine, reducing culls and increasing, by a great deal, customer satisfaction. Mr. Harvey described briefly the practical advances which have been made in the Gardner-Harvey mill in the directions outlined and described as well the caliper controller and the steam controller which are now beginning to be well known to the trade.

In answer to questions on the caliper control instrument, Mr. Harvey said that the instrument had been developed for chip boards, combination boards, and boards made from old papers and was a control of caliper and not of weight. Therefore, he wanted to see it tried on boards made from other classes of fiber before he recommended it unreservedly because he felt that fiber variation might bring about a variation in weight when running a control set to caliper.

Mr. Harvey concluded by saying that he could be away from his mill for days or weeks and on returning could tell from his recording charts exactly what each machine tender had been doing in that time. Finally, records were for use and not for filing.

Question Box Discussion

The discussion took the form of a question box to which the members had been asked to contribute in order to provide material for the session. The short time available for the question box limited the discussion to about four or five questions but as the members got warmed up some interesting points were developed.

A strawboard man set forth that he had 48" cylinders and what seemed to be adequate equalizing pipes. However, on light weights there appeared, in the sheet, holes that bore all the signs of slipping cylinders. It was demonstrated that there was no slippage. What was the trouble?

It was the consensus of opinion that the treatment of the stuff was chiefly to blame and attention to the jordaning was suggested.

How to eliminate foam on a light sheet was the next subject presented. This question broke away from the question of light sheets alone and went on to foam killing in general.

Showers and a box-like baffle were recommended to keep the foam away from the sheet. It was suggested that there might be too much agitation, beginning in the screens and continuing all the way down into the vat. Setting the screens too high above the vats was deplored and the added criticism was made that frequently pipes connecting screens and vats were much too small. All this, it was contended, produced agitation and, consequently, foam.

The discussion then went on to the chemical killing of foam. There was practical agreement that kerosene was the wrong thing for killing foam. A fundamental reason for this was given that kerosene or coal oil was a solvent of size. The use of kerosene induced gumming in the press rolls, it was said.

It was urged that foam be killed by making the stock more acid and by decreasing the surface tension by some oil—vegetable or mineral—but not coal oil. It was brought out that Fleischman Company has trouble with the foaming in the yeast tanks. Here they use a red oil supplied by Procter and Gamble.

There was a repetition of the warning against using a solvent of size.

One member said that he had been forced by a customer manufacturing a food product to eliminate the kerosene. He consulted the Standard Oil Company's experts and they recommended a mineral oil which served the purpose very well.

Distilled vegetable tallow was among the substitutes for kerosene recommended. It was also claimed that a half pint of vegetable or mineral oil might be used as effectively as four or five quarts of kerosene.

On the subject of lime consumption in cooking straw a member offered the information that a lime high in calcium content was much more economical than a lime high in magnesium content. This was from a standpoint of consumption per ton and from the point of view of the cost of slacking.

It was agreed on all hands that the only thing to do with a soft and chattered calender roll was to throw it out.

What causes heavy board to check was the final question considered. It was contended, to begin with, that board checks in the presses and not on the dryers.

It was agreed that the stock has something to do with checking. A tightly formed sheet doesn't check and a loosely formed sheet does, was what several claimed. Get the stock right by the use of proper control instruments was one suggestion.

One superintendent said that checking seemed to be affected by a change of atmosphere in the mill. He finally traced it to the effect of the atmospheric condition in tightening or slacking the belt driving the helper rolls. He solved his problem by putting an idler on the belt and controlling the idler by a compound lever on which weights could be run. This stopped the checking at once by insuring a uniform tension of the helper roll drive.

FRIDAY SITTING

Report on White Water Recovery

The Committee on White Water Waste, of which H. W. Server is chairman, with Fred J. Rooney, E. H. Gilman, C. S. Youngchild, James G. Ramsey, Harlowe G. Funsett, C. K. Andrews, William H. Sievert, Carl Magnus, N. J. Niks, A. W. Simpson, S. Carroll Wentz, A. F. Allen, S. W. Smith and Benjamin T. Larrabee, associates, brought in a report covering sixteen printed pages. Some of the contributions were by members of the committee and others by interested parties, either members of the association or of T. A. P. P. I. It constituted a symposium on the subject, which was of great value, being headed by a statement of the chairman in which nearly all aspects of the subject were considered.

Initial Losses.—He began by instancing the losses or shrinkage from white water waste in a converter mill, by which he meant a mill in which all the stock was purchased and delivered in rolls or bundles. He said it would be found on investigation that shrinkage from wrapping and baling wires would amount to approximately 2 percent, which in the case of a fifty-ton mill would mean one ton a day, and at four cents a pound would amount to eighty dollars. The stock was purchased on an air-dry basis, which meant that it contained 10 per cent of moisture and theoretically would require 110 pounds of stock to make 100 pounds of finished product. This with 2 per cent shrinkage for wrapping and baling gave a total of 12 per cent at the start.

Recovery Problems.—In the reuse of white water, the problem was how to separate fiber and other valuable material. It must be done by concentration, by raising the 0.02 per cent solids in white water to a 2 per cent consistency, when it could be returned to the stock chests, without varying the weight on the machine.

Mr. Server mentioned the flotation method for the recovery of fibers. Air was forced down through a hollow shaft to a perforated runner in the bottom of the tank, the shaft and runner traveling at a very high rate of speed to cause violent agitation. This method could be used only with a suspension of fiber that contained no loading material. The power and equipment required cost more than the value of the recovered fiber and the system never passed the experimental stage.

Types of Save-Alls

The two principal types of save-alls, the screen type and sedimentation type were described briefly. The first named could be divided into the outward flow and the inward flow. The outward flow has the greater capacity but least efficiency. The inward flow type of save-all included the Bird, the American, Oliver and Pneumatic. Some of the save-alls named had a guaranteed efficiency of 96 per cent when 3 per cent to 5 per cent of fiber was added to the white water before passing it through the save-all. This long fiber forms a film on the screen, which serves as a filtering medium and will give a save-all effluent of 0.5 of a pound per 1,000 gallons of water so filtered.

The sedimentation type of save-all is used principally by mills making heavy clayed paper. When not crowded beyond its capacity it is very efficient. Mr. Server said he had seen many tests taken that showed less than 0.5 pound per 1,000 gallons in the clarified water.

Combination Method.—The ideal system, according to Mr. Server, was a combination of inward flow screen and sedimentation type of save-all. In this the inward flow save-all was made an integral part of the paper machine, all the white water and stock from the couch pit of the machine being passed through the screen save-all, pumping the recovered fiber back to the machine chest and using as much of the effluent from the screen save-all as possible on the showers, on the screens and the wire of the paper machine, the remainder being sent to the sedimentation tank for use in the beater room on beaters and jordans. This resulted in a closed system.

Saving Water.—Mr. Server said that some book mills who operated de-inking plants used the closed system successfully without returning any of the white water to the showers on the paper machine wire and screens. By using the inward flow save-all with the return of reclaimed fiber to the machine chest, the clarified water is used as wash water in the de-inking plant, thus effecting a great saving in white water.

What the Loss Amounts To.—When it is considered that the white water, if no save-all is used, contains from six to ten pounds of solids or valuable papermaking material per thousand gallons of water, which if allowed to go to the sewer meant a heavy loss, he counselled his hearers not to be easily persuaded not to use white water save-alls. As a concrete example, he instanced the case of a 30-ton mill which, if it wasted 300 gallons a minute at 6 lb. per 1,000 gallons, would mean 100 pounds an hour, or 2,400 pounds a day, and assuming the average cost of fiber to be four cents a pound, this would mean a daily loss of $100, or $30,000 a year.

He said that the production of all grades of paper in the United States for the year 1925 was approximately 8,000,000 tons. Every 1 per cent saving would mean the conservation of 80,000 tons of material, which at an average figure of $50 a ton would represent a saving of $4,000,000. A conservative estimate indicates that an average reduction of at least 5 per cent of the waste losses is possible.

The advantages of using save-alls, with figures of results obtained at the P. H. Glatfelter Company's mill, Spring Grove, Pa., were described in a paper by S. C. Wentz, and H. G. Funsett discussed the problem of waste water in strawboard and strawpaper mills, where the use of the Dorr clarifier had proved serviceable.

C. K. Andrews submitted a report of results obtained in a mill manufacturing groundwood and news print paper. He gave figures showing the losses of stock at different places in the mill, which were quite informing. At the mill with which he was connected inclined wire save-alls are used, but it was found that the effluent still contained considerable fiber and the merits of the Oliver filter are to be investigated.

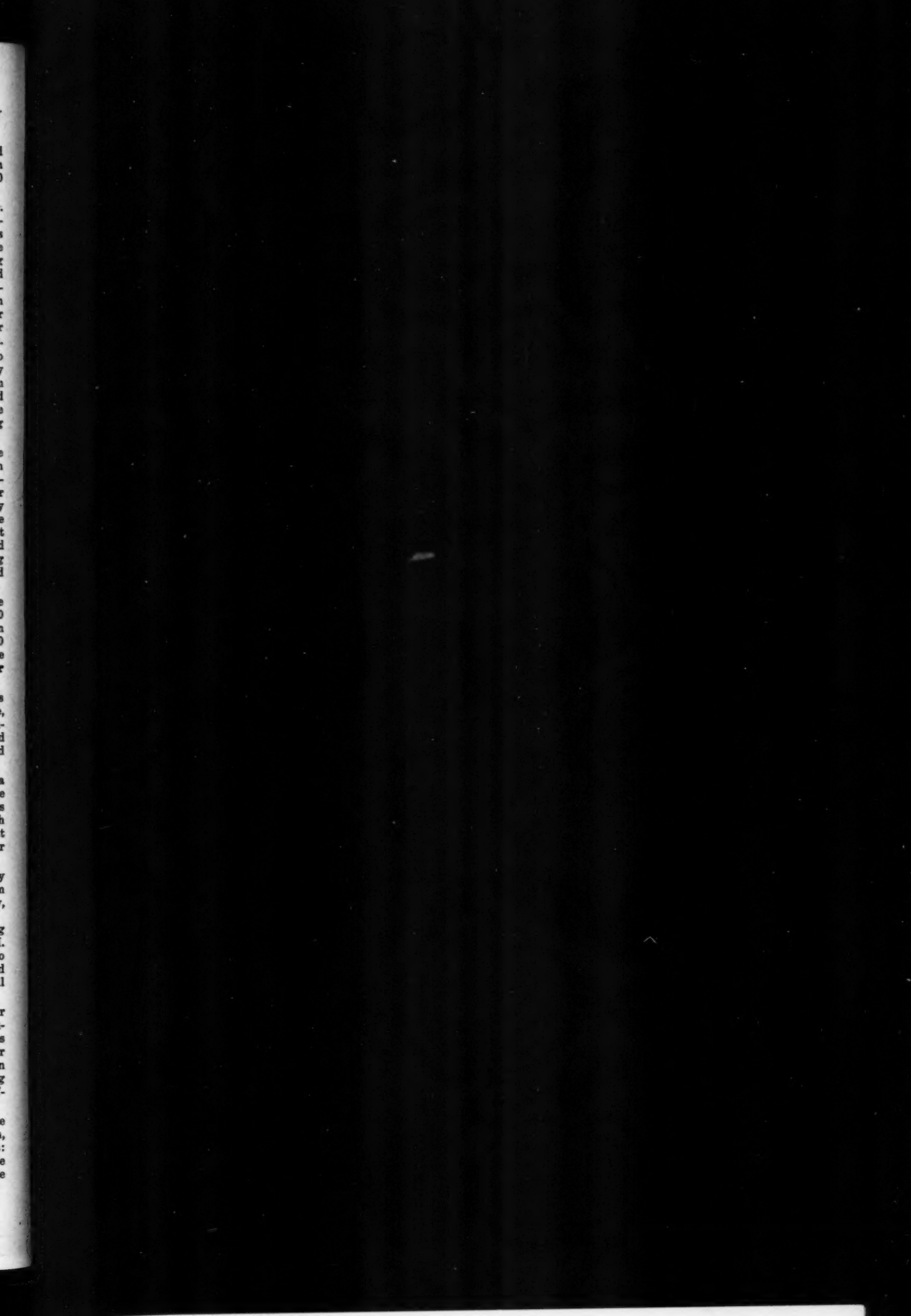
Among the papers submitted in the symposium was one by Harold M. Eastman, which did not differ substantially from the one he presented at the meeting of a division in Albany, N. Y., last year.

The value of the American Filter as a means of reclaiming fiber from white water was emphasized in a report by E. H. Gilman and E. G. Milham, of the Bryant Paper Company, who also praised the efficiency of the Oliver filter. High speed screening save-alls, of the North type, were not so well adapted for mills making high grade book paper.

Wastes in General.—The chemical treatment of waste water was discussed by Stephen W. Smith. The addition of a solution of alum containing about five grains to the gallon was said to be effective. There was no way of treating regular boiler waste, which was generally drawn off into a tank wagon and disposed of on some dump. Washer wastes from washing engines should be treated on graded sand filter beds of sufficient area to allow the beds to dry out before souring.

Results at Tidewater Mills.—Arthur F. Allen submitted the report of a test made at the Tidewater Paper Mills, Brooklyn, N. Y. The test occupied one week, and was stated as follows:

1—There was 3,100 pounds less stock in our system at the end of the test than there was at the beginning. Therefore this amount has been included in the next item.



2—Pounds of bone-dry stock furnished during test, 1,171,-113.91.

3—Pounds of bone-dry paper made during test, 1,144,392.2.

4—Inclined screen type of save-alls used.

5—Quantity of white water to save-all during test, 2,592,-000 gallons.

6—Pounds of stock per thousand gallons of white water, 15.5.

7—Pounds of stock per thousand gallons of save-all effluent, 14.1.

8—Quantity of save-all effluent to sewer, 1,800,000 gallons.

Commenting on the foregoing figures, he said that the system was a fairly well closed one and that an average of less than 3,000 gallons of water per ton of paper were used. The inclined screen type of save-all was not so efficient as was desired and would likely be abandoned for a Dorr or an American Filter.

Using Filtered Water.—A contribution by Joseph D. Small and Benjamin T. Larrabee, of the S. D. Warren Company, covered the general ground of white water recovery. The uses of filtered water were enumerated. In the manufacture of unbleached sulphite pulp, practically all the white water can be reclaimed and used for washing the pulp in the blow pits and at the head box for the screens.

W. D. Gregor described the methods employed by him in the settling of white water and touched on the systems used in the de-inking plant and sulphite mill.

B. T. McBain described the various characters of waste and instanced a 100-ton newsprint mill making 75 tons air-dry ground wood and 25 tons air-dry sulphite, in which nothing was wasted. This he said was an ideal plant, with evidently a perfect closed system.

Mr. McBain advised the use of the best possible equipment wherever possible. He favored cutting off the fresh water at all points and putting all water pumps on the screened return water at some one or more central tanks. In the next mill he built he would have screened return water connected with a wash-up hose so that if it was left running into the white water pit, the water would simply circulate.

Operation of Dorr Save-All.—A report from the Peerless Division ofthe Mead Pulp and Paper Company giving the figures on Dorr save-all operation was suggestive and informing. It was followed by Vance P. Edwardes's contribution on "Pulp and Paper Mill Discharge in Relation to the Purity of Streams," and the report of the Committee on Waste of the Technical Association of the Pulp and Paper Industry as presented at the annual meeting of that association last February, and published in THE PAPER INDUSTRY at the time.

WHITE WATER DISCUSSION

It was necessary on account of time limitations to defer the consideration of the paper by Vance P. Edwardes on "Pulp and Paper Mill Discharge in Relation to the Purity of Streams," to a later sitting. Most of the discussion was concerned with Mr. Server's report, though the contribution by S. C. Wentz attracted a good deal of attention.

Saving of Waste a Source of Profit

Dr. Hugh P. Baker said he was impressed by the saving of waste which could be effected by the use of save-all systems, as the manufacturers were looking to sources of profit in manufacture rather than the raising of prices on the product. He spoke of the appointment by the American Paper and Pulp Association of a national committee on stream purification which was to hold its first meeting in Chicago on June 9. A subcommittee on plans would be appointed and the superintendents' association would likely be called on for help.

Nelson R. Davis asked Doctor Baker if expenses had been considered and if his association had made any appropriation. This was answered in the negative. Mention was made of the Brown bill which had been introduced into Congress for the appropriation of $50,000 to defray the expenses of an investigation, but it was hopeless in this era of economy to expect that any action would be taken on it.

Wants Figures Checked

James G. Ramsey expressed some scepticism concerning the amount of fiber that had been reported to be reclaimed by the use of save-alls and asked if accurate measurements of weights had been taken of the stock furnished and paper produced, and he also wanted to know if slush or air-dry stock was used in the mills reported by Mr. Server.

Mr. Gephart explained that the report was based mainly on work done by Server at the mill of the Miami Paper Company, where only dry stock was used. No actual records of weights of material furnished to the beater were kept, the figures being based on inventory.

Referring to the great saving of water reported by Gephart, Jack O'Connell said it was evident there was no water at all used in the operation. He said he didn't doubt the accuracy of the statements but they sounded fishy and needed explanation. Incidentally, Thomas H. Savery, Jr., came in for a lot of good advertising, as President Coughlin remarked, after repeated references had been made to the types of shower pipes, save-alls, showers and beaters which Mr. Sievert and others had said they had purchased through Mr. Savery.

White Water on Cylinder Machines

T. F. Sullivan, of the Eddy Paper Corporation, inquired if anyone was using the white water on a cylinder machine. Fred J. Rooney said he was not doing it but that his boss had asked him to do it. If it could be done with a Fourdrinier it could be done with a cylinder. Tom Harvey advised Mr. Sullivan to visit the plant of the Chicago Mill & Lumber Company at Cincinnati, where he would see backwater used on everything. At his own plant, the Gardner-Harvey mill, white water or backwater is furnished to the rotaries and showers. Jack O'Connell asked Mr. Gephart the amount of fresh water used per diem at the Miami Paper Company mill and was answered 1,500,000 gals. for four machines.

Slime Formation

After Mr. Wentz had read his paper on "White Water," George K. Walker, of Finch, Pruyn & Co., gave it as his opinion that there were a number of satisfactory save-alls on the market but it was possible to construct a home-made system to answer all purposes. As for a closed system, he said that one could be bottled up so completely that at the end of a week the water would be too foul and rotten for continued use. The subject of slime formation was brought up and Vance P. Edwardes said that slime could be prevented by the use of chemicals, algicides as they were called. In the West, copper sulphate and chlorine were used. R. W. Haddock, of the Escanaba Paper Company, asked if the chemicals used to clean up the white water exerted any harmful effect on the piping. Jack O'Connell said that copper pipes accumulated slime in the same way as other pipes do.

American Filter Described

C. B. Oliver, of the United Filters Corporation, 565 Washington Boulevard, Chicago, was introduced and gave a most interesting description of the American Continuous Filter which operates to form layers of pulp on the outer sides of disks through which the water passes while the disks are revolving. The room was darkened and motion pictures were projected on a screen to show the operation. Ten V-shaped sectors make up a round revolving disk, each sector being covered with a specially woven wire which allows the water to pass through the machine filtered so completely that it can be reused in the machine showers.

Joseph H. Slater paid a high tribute to the value of the apparatus which he said had been used in the Escanaba mill for a month with excellent result. One machine takes care of 47 tons of groundwood daily and it is expected to pay for itself in eighteen months.

New Officers Elected

At the close of Mr. Oliver's demonstration the Committee on Nominations was asked to present its report and Jack O'Connell, chairman, responded with the following slate, after explaining that it was impossible for Mr. Coughlin to serve another year owing to the fact that he had been elected a director of his company.

President—Fred J. Rooney, The Upson Company, Lockport, N. Y.

First vice president—Benjamin T. Larrabee, S. D. Warren Company, Cumberland Mills, Me.

Second vice president—James G. Ramsey, Dill & Collins Company, Philadelphia.

Third vice president—George H. Pountain, Allied Paper Mills, Kalamazoo, Mich.

Fourth vice president—Joseph H. Slater, Escanaba Paper Company, Escanaba, Mich.

Fifth vice president—Carl Magnus, Standard Paper Manufacturing Company, Richmond, Va.

Secretary—Robert L. Eminger, The Miami Paper Company, Miamisburg, Ohio.

Treasurer—Peter J. Massey, Wm. F. Hall Printing Company, Chicago.

On motion of William Brydges the secretary was instructed to pass one affirmative ballot for the officers named.

Resolutions Adopted

Then followed the report of the Committee on Resolutions, Peter J. Massey, chairman. The resolutions numbered six in all, beginning with one calling for the appointment of a committee of three members to make a survey of vocational education and formulate a constructive program. In the second resolution, the president was authorized to appoint a committee of one to investigate the purification of mill effluents and report at the next meeting. The third resolution provided for the appointment by the president of a chairman "To formulate a program of activity among the mechanical and chemical superintendents so that this committee will act as a clearing house for information concerning the practical problems involved in the manufacture of pulp." As a rider to this, the chairman is to be instructed to appoint a committee on membership to stimulate interest in the mechanical and chemical pulp divisions.

The movement for uniform and model forestry legislation throughout the United States was endorsed, and, finally, the president was authorized to appoint a chairman of a "Practical Problems Committee" for the operation of a clearing house for the solution of problems in the manufacture of pulp and paper.

After the Auditing Committee had reported that the audit of the treasurer's books was correct the sitting was adjourned.

SATURDAY SITTING

President-elect Rooney opened the meeting on Saturday morning an hour after scheduled time. Before adjourning on the previous day, Jack O'Connell had brought up the question of next year's meeting place and expressed regret that the committee had decided to name Richmond, Va., instead of Watertown, N. Y. At his suggestion the matter was referred back to the Executive Committee for further consideration. Before proceeding with the regular business, Chairman Rooney announced that the committee had reconsidered the matter and the vote was unanimous in favor of holding the 1927 meeting in Richmond.

Strapping Paper with Wire

First on the program was a paper illustrated by motion pictures showing developments in the wrapping and tying of paper with wire for skid, roll and case shipments.

Use of Wire in Tying Paper for Shipment

W. M. Purdy, salesmanager of the Gerrard Wire Tying Machines Company, Chicago, exhibited moving pictures showing new developments in tying paper on skids, the tying of carloads of paper in rolls and the tying of boxes by wire as made applicable by the Gerrard wire tying machine. He said that in the tying of roll stock in cars it was no longer necessary to have the car lined with padding on the sides as shown in the picture, recent improvements having been effected to eliminate this. The wire is now stapled to 1x3 uprights which prevents the wire slipping and protects the corners of the rolls. The skids are made of wood and the entire cost with wire ranges from $3.50 to $5. The skids can be used over and over again. In further elaboration of the cost, Mr. Purdy said:

"The wire costs between 40c and 60c a skid, depending upon the size of the skid. One man can very easily tie a skid in from ten to fifteen minutes. The paper that can be shipped on a skid, when shipped in boxes cost from $20 to $24 for the boxes, plus the labor cost for mailing, strapping, etc. The cost for a skid wired with the same amount of paper is from $4 to $6, which shows a saving of from $16 to $18 on two to two-and-a-half tons of paper in packing cost. The cost of handling is reduced both by packer and customer as there is only one unit to handle instead of eight or ten. There is also a saving on the amount of lumber used on the boxes over the amount of wire used on a skid plus the wire."

Pictures thrown on the screen showed how roll paper was shipped in carloads with the elimination of paper padding on the sides, plus 1x3 uprights. Where the wire might touch the edge of the roll it was shown that the paper is protected by metal corner strips.

Mr. Purdy referred to the lower cost of tying roll paper in cars with the cost of blocking and bracing, saying it amounted to $2 as against $5 to $15.

He said that by the use of the Gerrard method the consignee was able to unload his merchandise in much less time, for with the skids, he merely cuts the wire and the skid is ready to be unloaded, whereas before it was necessary to open a number of boxes. In connection with roll paper, the consignee merely cuts the wire and the paper is ready to be rolled out, whereas formerly it was necessary to draw out the wood bracing and blocking.

Mr. Purdy said he was convinced the Gerrard wire tying machines could be used in every paper mill, either for boxing, skidding paper or tying roll paper in carloads. By the use of wire the packing cost was considerably reduced.

Considerable interest was taken in the operation of the Little Giant Machine, the work of which in strapping boxes, tying paper on skids and holding carloads of roll stock without braces by means of wire, had been so clearly illustrated in the moving pictures projected by Mr. Purdy. A. G. Stone asked if 9-inch rolls could be tied with wire, referring to mixed carloads, and Mr. Purdy said that this would be investigated, as he had had no actual experience with such shipments.

Joseph H. Slater said the apparatus was employed at his mill in Escanaba and by its use there was a reduction in costs of packing amounting to 50 per cent, while customers reported receiving paper supplies in better condition than formerly. Mr. Pountain inquired if Mr. Slater blocked his carloadings and was told that he didn't, the skids being bound together without blocking. Others testified that the best procedure was to send skid paper without blocking.

Paper Oracles

Succeeding speakers made felicitous references to "The Tie That Binds" in other relations, as did S. L. Willson, president of the American Writing Paper Company, when he arose to address the gathering on "Modern Merchandising of Paper and Its Relation to Production," and instanced the advantages of executives keeping in close touch with the men in the mill. Before taking up the subject of his paper, Mr. Willson told a story to illustrate the necessity of caution in passing judgment on paper subjects in view of the changing conditions in merchandising and production. He had been approached by a business associate to get his opinion on the character and value of a certain sample of paper and rather than commit himself hastily he suggested submitting the sample to another associate who thought he knew everything about paper and was indeed obsessed with his superior knowledge, so that he would undertake to tell with the greatest confidence whether a certain piece of paper was hand or machine made —rag or wood—loft dried or machine dried, as well as its value and use. On handing the paper to the oracle, with the query, "Say, Bill, what kind of paper is this?" he got the answer, "Why, that's a piece of hand-made paper, made in Italy by Fabriano Co., a very unusual quality and made of the finest grade of pure linen rags which Fabriano secures from secret sources in Egypt, the rags being obtained from the linen covering the bodies of mummies."

It Was a Hornets' Nest—Mr. Willson told how impressed he was by the man's superior knowledge until the gentleman who had asked for an opinion of the paper and was standing by, said: "Thanks, Bill, for your interesting detailed information, but this morning as I was coming in from the country, I picked this piece of paper out of a tree, and then I had to run like hell to get away from the hornets that made it."

The moral of this was that it was best not to know too much about paper that one has not seen made.

Origin of the Paper Jobber—The origin of the paper jobber was explained by Mr. Willson. A century ago there were only a few paper mills in this country and there was no at-

tempt at specializing; production lacked uniformity either as regards weight, quality, color or finish and all paper was made from rags or straw. More or less paper without uniformity would accumulate in the mills until a prospective purchaser came along to bargain for the lot. The buyer actually bought job lots and was known as a jobber. Almost the entire product of the mills was handled by the jobber, who later developed into a wholesaler and still later became the present day merchant or distributor.

Standardization—The rise of standardization was traced from the time when manufacturers began to make paper to meet the ideas of others rather than their own. The jobber could then have his papers made according to specifications; buy in anticipation of his business requirements; keep a stock of paper in his own warehouse or store and give more satisfactory service. He then graduated from jobber to wholesaler.

Research Work—Mr. Willson spoke of the remarkable progress that had been made in research work during the past ten years. Research work in the paper industry was being carried on not only by manufacturers, but also by merchants, salesmen and consumers. By research work new uses for paper are being discovered.

Direct Sales Have Increased—More paper is sold today direct from manufacturer to consumer. Instead of practically all grades of paper being sold through the jobber and wholesaler, large percentages of direct sales are made. In the case of newsprint the proportion was stated as 85 per cent direct to 15 per cent indirect; and of boards 90 per cent direct, as compared with 10 per cent indirect. Cover paper is sold largely through merchants, the proportion of sales being 80 per cent indirect and 20 per cent direct. In the case of wrapping paper the proportion was stated as 50-50.

Rates of Distribution—According to Mr. Willson, the approximate proportion of the tonnage of which 100 per cent was formerly sold through the jobber is as follows: Jobber, 1 per cent; wholesaler or broker, 4 per cent; distributor, 25 per cent; direct, 70 per cent. Expressed in tonnage the foregoing percentages read: Jobber, 100,000 tons; wholesaler or broker, 400,000 tons; distributor, 2,500,000 tons; direct, 7,000,000 tons.

Mr. Willson was of opinion that the distribution would be maintained in the foregoing ratio for some time to come. Although a great deal of direct selling is done, the merchant is today more of a factor in the industry than at any time in the past. He said that the mills were more dependent upon paper merchants for the distribution of that type of tonnage handled by them than ever before. Mills are unable to handle the smaller units of sales so advantageously on account of inadequate sales organizations and distributing centers.

In Praise of Associations—In closing, Mr. Willson said a good word for association work. During the past three years he had attended many meetings and had never left one without securing some helpful information. A strong advocate of associations, he liked to see people in the same line of business get together and exchange ideas, because all were benefited and he was benefited most who gave most.

After expressions of appreciation for Mr. Willson's address, voiced by Chairman Rooney and Mr. Slater, he was tendered a rising vote of thanks.

Thomas E. Dial, of the Vacuum Oil Company, was then invited to present his paper on lubrication. He said he had been a constant attendant on the meetings of the association and had been impressed with their educational value.

Principles of Correct Lubrication

The paper by Thomas E. Dial, of the Vacuum Oil Company, New York, discussed conversion costs as affected by lubrication. After giving an analysis of power and maintenance factors affecting production costs, in the course of which he developed the fact that present processes of paper manufacture required more power per ton of product than almost any other industry, he made the statement that the competition of one mill with another was one of power cost, if items of conversion costs depending upon power generation were to be considered part of raw material cost and the technique of processing in different mills were equal.

Developing this theme, he said it would follow that the most successful organization would be the one having the lowest cost for power and which used the least power per unit of output. This was where correct lubrication came in, according to Mr. Dial, and he defined correct lubrication as "the right oil in the place, in the right way."

Mr. Dial then mentioned some of the mechanical conditions in paper mills that required special attention in the choice of a lubricant for bearings such as are found in wet machines, presses and the table rolls of Fourdriniers. Losses of power through faulty lubrication were enumerated, though he stated that power was not the only factor affected by lubrication. Speed, by which he meant the synchonized speed of all the machinery used in the forming, drying and finishing of the paper sheet, was more important in paper making than in any other industry. The whole system might be in tune at one period and by the slowing up or slippage of a press through lubrication errors end in "broke" or loss of production.

He gave figures of power savings effected on supercalenders by operating with correct oil. These showed 14.78 h.p. on one stack of calenders and 18.6 on another. With mills operating as high as twenty-two supercalenders which he had visited this would mean a saving of upwards of $10,000. In view of this the term "oil cost" should hold no terrors for the superintendent in terms of horsepower saved. In comparison with power cost, both steam and electrical, oil cost was ridiculously low—34/100 of 1 per cent as against 47 per cent for power. Mr. Dial asked, why with a cost as low as this superintendents should spend sleepless nights worrying about a few cents more or less per ton when dollars might be saved by care in selection of a lubricant.

Harold J. Payne, of the Society for Electrical Development, was then introduced to present a study of methods of cutting handling costs with electric trucks, which included the conservation of material, power and labor. The Society for Electrical Development had made a study of the electrical equipments of twenty mills which afforded a cross sectional view of the applications of electricity in the paper industry.

Use of Electric Trucks in the Paper Industry

The use of electrically driven trucks for transportation within and between department in pulp and paper mills was the subject of a paper by Harold J. Payne, of the staff of the Society for Electrical Development, New York, which was illustrated by lantern slides. He gave instances of the economical use of electric trucks in a Maine mill for moving logs from the pond to the grinders. Formerly it was necessary to use a spur railroad track, the cars being unloaded as brought in and the wood handled again for feeding to the grinders. With the use of electric trucks rehandling was eliminated, skid loads of about 3,500 pounds being wheeled directly to the grinder platform.

Mr. Payne enumerated the class of materials handled by electric truck as all bagged material, baled stock, wet laps, paper in rolls and in flat packages, box shooks, machinery and mill supplies and in some cases such bulk materials as coal, ashes, stone, etc. Depending upon the type of service, one of five major modifications of the truck was usually employed—the straight platform general utility truck, and low lift truck that carries its load on platform skids; the tiering truck, similar to the low lift except for the fact that it carries its load up to heights of four to ten feet; the crane truck and the tractor.

He said that any of these machines could be operated at a total fixed charge not exceeding $3.50 per eight-hour day. Against this fixed charge amounting approximately to the wage of a single laborer there was a saving of from $3,000 to $15,000. This meant that for each truck placed in service from two to ten men could be released for other work.

Power maintenance costs of six trucks of the elevating platform type used by the Beaver Products Company at its Buffalo plant amounted to 0.78, exclusive of driver's time, interest and depreciation.

He mentioned other plants where the electric truck was used successfully in various operations. He said that the men liked the power truck and took pride in keeping them in good running trim. Overhead on a fleet of six trucks at the plant of Bird & Son, roofing manufacturers, East Walpole, Mass., amounted to about $50 a month for each machine or about 40c an hour. For this outlay the capacity of each of

the truckers had been increased from 55 to 83 tons per week. In one day the loading gang handled a 26-car train, each averaging twenty tons.

The idea of shipping on skids originated with the paper industry and some consumers of paper insist on receiving all of its stock in this form. Where it formerly required the service of nine or ten men for half a day to unload a carload of paper in a lithographic plant, two men using a high lift electric running directly into the car can do the job in thirty minutes.

There are roll-handling trucks for use in conveying paper in rolls. He mentioned the device used by the Philadelphia Paper Company. Two trucks, each of two tons rated capacity and with a uniform lifting range of 122 inches, are operated. Working in tandem these trucks carry rolls weighing up to five tons, 110 inches long, with a diameter up to 56 inches. The total cost of the equipment averages $6 a day.

Bales of pulp are conveyed from storage to beater in the A. P. W. Paper Company's mill with the use of a straight platform truck along with trailers for which the load carrier acts also as a tractor. By the use of this truck a saving of fourteen men had been realized.

Need of a Chart

Following Mr. Payne, Dr. Hugh P. Baker was recognized and paid the association many compliments on the progress it had made during the past two years. He said that each one of the meetings showed an improvement over the preceding one. He took keen interest in observing its development. Having got through with organization work—the tie that binds—and rounded out membership work, it seemed to him that the association should now be in a position to pay dividends. He hoped that steps would be taken to chart the future course of the association by outlining a definite program which would take in problems of engineering and education as well as the problem of supplying trained men for the industry. In meeting these problems the association officers would be developing the larger vision.

Doctor Baker again emphasized how important it was for the Superintendents' Association to chart its course and have a definite goal in view. Having now overcome the criticisms and questioning that prevailed in the early days and won the general goodwill of the mill owners, it was necessary for the association to maintain that favorable consideration.

Stream Purification

The paper by Vance P. Edwardes on "Pulp and Paper Mill Discharge in Relation to the Purity of Streams," which had been postponed from the previous sitting was then called for and Mr. Edwardes summarized it briefly.

After passing votes of thanks to all who had contributed to the success of the convention, with a special rising vote to William F. McGraw, general chairman of the Convention Committee, the meeting stood adjourned.

ENTERTAINMENTS

The social features of the meeting were very enjoyable. There were two banquets, one on Thursday night for the men and women, and one on Friday for men only. Special luncheon parties and motor car trips were provided for the ladies and alternate trips were provided on Friday to the River Rouge plant of the Ford Motor Company and to the publishing and printing offices of the Detroit News.

Edgar Guest Recites Poetry

At the banquet on Thursday evening members and visitors were privileged to hear the poet Edgar Guest recite a number of his own poems. Mr. Guest imparted a dramatic quality to his verses which gave them a new value and heightened everybody's appreciation of his lyric gifts.

Analysis of Business

The principal speaker of the evening was George E. MacIlwain, a Boston economist, who gave an analysis of business conditions and tendencies. The present, he said, was not a time to go around in the doldrums as 150 business forecasters in the United States had analyzed conditions and predicted that there would be an improvement in the fall. The trend of commodity prices was downward and from now on lower wages would prevail, though this would be more apparent than real since retail prices would decline at the same time as the decline in wages. He analyzed the figures compiled by statisticians on the number of employed and unemployed and carloadings. He said that low priced goods were in better demand than high priced goods, which would account for the prosperity of chain stores which did 30 per cent more business last year than the year before. He scouted the fear of European competition and said to dismiss and forget it. The policy of employers in cultivating closer relations with workers was at the basis of the present remarkable period of prosperity in the United States, but the effects of overproduction are likely to be felt during the last four months of this year which are not likely to be as prosperous as the corresponding period of 1925.

At Friday night's banquet Governor Alexander Groesbeck of Michigan was represented by Lt. Governor George Welsh, the toastmaster being C. A. Blaney. Lewis Shank, former mayor of Indianapolis, shared the honors with Lt. Governor Welsh, and Felix Pagenstecher, of the Allied Paper Mills of Kalamazoo, made the response for the association.

Members and Visitors in Attendance

The number of members and visitors who attended the seventh annual meeting of the American Pulp and Paper Mill Superintendents' Association at Detroit, Mich., June 3 to 5, exceeded that of any previous meeting. The registry cards yielded 319 names but there were many visitors who failed to register. At the banquet on Friday evening upwards of 600 were in attendance. The following names are of those present who registered:

A. G. Adams, A. G. Adams & Co., Chicago; A. J. Allison, A. A. Simonds-Dayton Company, Dayton, Ohio; O. W. Anderson, Gerrard Wire Tying Machine Company, Chicago; W. A. Anderson, Lincoln Paper Company, Elkhart, Ind.; H. J. Andrews, Griley-Unkle Engineering Company, Fort Wayne, Ind.; Ross Anvil, Crystal Tissue Company, Middletown, Ohio; M. J. Argy, Cliff Paper Company, Niagara Falls, N. Y.; G. J. Armbruster, Fraeser Company, Ltd., Edmundston, N. B.; M. N. Arthur, Appleton Woolen Mills, Springfield, Mass.

Hugh P. Baker, American Paper and Pulp Association, New York; A. H. Barlow, Hagar Strawboard and Paper Company, Cedarville, Ohio; F. L. Barstow, U. S. Rubber Company, Fitchburg, Mass.; Charles B. Barton, Jr., Michigan Paper Company, Plainwell, Mich.; A. L. Beals, Newark, Del.; E. N. Bechard, Eastwood Wire Manufacturing Company, Belleville, N. J.; George F. Begnal, Baker Manufacturing Corporation, Saratoga Springs, N. Y.; F. K. Becker, Bird Machine Company, South Walpole, Mass.; G. W. B. Bennett, Security Rubber & Belting Company, Chicago; Harry Bennett, Valley Iron Works Company, Appleton, Wis.; Bernard Benson, Williams Gray Company, Chicago; N. H. Bergstrom, Bergstrom Paper Company, Neenah, Wis.; Henry Bert, Monroe Paper Products Company, Monroe, Mich.; John L. Bert, Consolidated Paper Company, Monroe, Mich.; Harold Bing, The Paper & Textile Machine Company, Sandusky, Ohio; John Bingham, Dill & Collins, Philadelphia; B. M. Bishop, Sonoco Products Company, Hartsville, S. C.; W. E. Blauvelt, Cameron Machine Company, Brooklyn, N. Y.; J. E. Blosser, Scott Paper Company, Chester, Pa.; Geo. A. Bogle, G. G. Cherry Company, Tama, La.; L. M. Booth, Booth Chemical Company, Elizabeth, N. J.; J. A. Bowers, Hammermill Paper Company, Erie, Pa.; F. C. Boyce, Wausau Paper Mills Company, Brockaw, Wis.; Clement Bradley, Provincial Paper Company, Thorold, Canada; P. D. Bradley, Fort Howard Paper Company, Green Bay, Wis.; William Brydges, Defiance Paper Company, Niagara Falls, N. Y.; J. P. Burns, Eddy Paper Corporation, Three Rivers, Mich.; W. H. Burns, Valley Iron Works Company, Appleton, Wis.; R. H. Breyfogle, Eddy Paper Corporation, White Pigeon, Mich.; L. H. Breyfogle, Draper Brothers Company, Canton, Mass.; A. E. Bridge, Shartle Brothers, Middletown, Ohio; B. M. Briggs, Lawrence Manufacturing Company, Lawrence, Kan.; M. V. Brooks, Miamisburg Paper Company, Miamisburg, Ohio; J. L. Brown, Imperial Belting, Detroit, Mich.; A. F. Brunell, Paper Makers Chemical Company, Holyoke, Mass.; Alfred Bryant, Bryant Paper Company, Kalamazoo, Mich.; Harry C. Brusser, The York Haven Paper Company, York Haven, Pa.

John F. Carroll, New York; C. J. Christiansen, Fibre Making Processes, Inc., Chicago; B. L. Clary, United States Rubber

Company, Toledo, Ohio; Arthur Cole, Rex Paper Company, Kalamazoo, Mich.; Arthur S. Cosler, Texas Gulf Sulphur Company, Chicago; G. L. Chamberlin, H. N. Hill & Co., Philadelphia; C. H. Champion, Paper Mill Supply Company, Kalamazoo, Mich.; Charles Champion, Berkshire Hills Paper Company, Adams, Mass.; J. M. Conway, Hoberg Paper and Fibre Company, Green Bay, Wis.; J. H. Cooney, Peninsular Paper Company, Ypsilanti, Mich.; John P. Cooney, Peninsular Paper Company, Ypsilanti, Mich.; John Cornell, The Paper Mill, New York; E. T. A. Coughlin, New Jersey Coated Paper Company, Montclair, N. J.; J. M. Cram, Security Rubber & Belting Company, Chicago; W. H. Croft, Esleeck Manufacturing Company, Turners Falls, Mass.; Wallie H. Cunningham, Mead Pulp and Paper Company, Peerless Division, Dayton, Ohio.

J. E. Daley, Port Huron Sulphite and Paper Company, Port Huron, Mich.; W. L. Davis, Jr., Dells Paper & Pulp Company, Eau Claire, Wis.; Samuel Dauman, M. Gottesman & Co., Inc., New York; D. B. Davies, Hoberg Paper and Fibre Company, Green Bay, Wis.; Nelson R. Davis, S. D. Warren Company, Cumberland Mills, Me.; V. S. Denison, Paper and Textile Machinery Company, Sandusky, Ohio; H. E. Dennie, Security Rubber & Belting Company, Chicago; John Detmier, The Gardner-Harvey Company, Middletown, Ohio; Edwin J. Dewey, Whitmer-Parsons Pulp and Paper Company, Philadelphia; T. E. Dial, Vacuum Oil Company, New York; J. C. Dieffenderfer, Paper Makers Chemical Company, Easton, Pa.; Henry Digman, Peninsular Paper Company, Ypsilanti, Mich.; H. J. Dow, Eastwood Wire Manufacturing Company, Belleville, N. J.; F. W. Drake, Lockport Felt Company, Newfane, N. Y.; Edward P. Driscoll, Smith Paper Company, Lee, Mass.; T. L. Dunbar, Stebbins Engineering and Manufacturing Company, Watertown, N. Y.; A. C. Dunham, Supply and Equipment Association, New York; Jas. H. Durkin, O. B. Andrews, Chattanooga, Tenn.; Theo. W. Dunn, Port Huron, Mich.

E. E. Eackart, Midvale Paper Board Company, Rossman, N. Y.; W. F. Ebbing, The Ohio Knife Company, Cincinnati, Ohio; Vance P. Edwardes, Forest Products Laboratory, Madison, Wis.; J. W. Eich, General Dyestuff Corporation, Chicago; Frank B. Eilers, Kalamazoo, Mich.; Charles L. Ellis, Downingtown Manufacturing Company, Downingtown, Pa.; R. L. Eminger, National Secretary, Miamisburg, Ohio; R. F. Engelhardt, United Paper Board Company, Thomson, N. Y.; L. H. Everlien, United States Rubber Company, Milwaukee, Wis.

William P. Feeney, Union Bag & Paper Corporation, Cheboygan, Mich.; J. B. Fleming, John G. Fleming & Son, Dallas, Tex.; A. G. Ford, The A. A. Simonds-Dayton Company, Dayton, Ohio; Jas. Foxgrover, Western Paper Makers Chemical Company, Kalamazoo, Mich.; Harry D. Frost, The W. S. Tyler Company, Cleveland, Ohio; Charles Fuhrmeister, Jr., Oliver Continuous Filter Company, New York; H. G. Funsett, Hagar Strawboard and Paper Company, Cedarville, Ohio; George J. Forman, Schmidt & Ault Paper Company, York, Pa.; W. B. Fulton, Fulton Engineering Company, Middletown, Ohio.

J. C. Gaylor, S. K. F. Industries, Inc., New York; O. P. Gephart, Miami Paper Company, West Carrollton, Ohio; Wm. G. Gilkey, Michigan Paper Company, Plainwell, Mich.; E. H. Gilman, Bryant Paper Company, Kalamazoo, Mich.; Gus Gilsoul, Fort Howard Paper Company, Green Bay, Wis.; Walker F. Glass, B. F. Goodrich Rubber Company, Akron, Ohio; P. H. Glatfelter, P. H. Glatfelter Company, Spring Grove, Pa.; Walter J. Goettsch, Samuel M. Langston Company, Camden, N. J.; N. B. Graham, Reiter Company, Elgin, Ill.; Robert M. Guie, Philadelphia Felt Company, Frankford, Philadelphia; John S. Gulledge, B. F. Goodrich Rubber Company, Akron, Ohio.

R. W. Haddock, Escanaba Paper Company, Escanaba, Mich.; W. Hadley, The Gardner-Harvey Company, Middletown, Ohio; T. P. Hannon, United States Rubber Company, Columbus, Ohio; Wm. R. Harris, Monroe Paper Products Company, Monroe, Mich.; C. L. Harter, Rex Paper Company, Kalamazoo, Mich.; Harold Harvey, and Tom Harvey, The Gardner-Harvey Company, Middletown, Ohio; J. L. Hayes, Bemis Brothers Bag Company, Peoria, Ill.; T. H. Hiltz, Security Rubber & Belting Company, Chicago; N. P. Hinkel, Carlyle Paper Company, Carlyle, Ill.; Roy W. Holden, D. P. Brown & Co., Detroit; J. H. Hollingsworth, Oswego Corporation, Fulton, N. Y.; Clayton M. Holt, Pennsylvania Salt Manufacturing Company, Philadelphia; Albert H. Hooker, Jr., Hooker Electrochemical Company, Niagara Falls, N. Y.; Joseph L. Hoolihan, Port Huron Sulphite & Paper Company, Port Huron, Mich.; H. A. Horstmann, General Dyestuff Corporation, New York; J. R. Hunter, Johaneson, Wales and Sparre, New York; Will C. Hurley, H. Waterbury & Sons Company, Oriskany, N. Y.; Allan Hyer, The Black-Clawson Company, Hamilton, Ohio.

T. H. Ireland, Crane Company, Chicago.

Harry Jacqmin, Fort Howard Paper Company, Green Bay, Wis.; H. S. Jarvis, Don Valley Paper Company, Toronto, Canada; E. S. Jenkins, M. W. Jenkins Sons, Inc., Kalamazoo, Mich.; H. H. Jensenius, Daniel N. Hicks, New York; E. J. Johnstone, Paper Makers Chemical Company, Holyoke, Mass.

H. E. Karberg, Lincoln Pulp and Paper Company, Ltd., Merritton, Ont.; Thomas J. Keenan, THE PAPER INDUSTRY, New York; George Keistead, John Richardson Company, Boston, Mass.; R. H. Kelly, Marathon Paper Mills Company, Rothschild, Wis.; D. M. Kelly, Bloomer Bros. Company, Newark, N. J.; W. A. Kelly, Northern Paper Mills, Green Bay, Wis.; Roy C. Kendall, Link Belt Company, Chicago; Archie J. Kennedy, The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.; George F. Kennedy, Hercules Powder Company, Wilmington, Del.; C. H. Kephart, York Haven Paper Company, York Haven, Pa.; Kenneth T. King, E. I. DuPont de Nemours & Co., Chicago; Harry C. Kinne, Bagley & Sewall Company, Watertown, N. Y.; C. E. Kinney, Hercules Powder Company, Wilmington, Del.; F. P. Knack, F. C. Huyck & Sons, Albany, N. Y.; L. F. Knickerbocker, Provincial Paper Company, Port Arthur, Ont.; Robert Knowles, Reading Paper Mills, Reading, Pa.; Edward Kormin, Heller & Merz Company, Chicago; Robert E. Krudenar, Lagerloef Trading Company, Kalamazoo, Mich.; W. J. Kyle, Cameron Machine Company, Brooklyn, N. Y.; Jacob Kuss, Watervliet Paper Company, Watervliet, Mich.

F. C. Ladd, Byron Weston Company, Dalton, Mass.; P. J. Lamoreaux, M. M. Paper Company, Marionette, Wis.; Benj. T. Larrabee, S. D. Warren Company, Cumberland Mills, Me.; John Leishman, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; H. R. Lewis, Hollingsworth & Vose Company, Boston, Mass.; W. T. Libby, Brown Company, Berlin, N. H.; Herbert Lippitt, International Paper Company, New York; Paul D. Luce, Boston Woven Hose and Rubber Company, Boston, Mass.; Chas. J. Ludwig, Mead Pulp and Paper Company, Chillicothe, Ohio; Arthur L. Loman, Robert Gair Company, New London, Conn., Allen A. Lowe, THE PAPER INDUSTRY Chicago; F. H. Lueders, The Seybold Machine Company, Dayton, Ohio.

A. C. Mack, The Manhattan Rubber Manufacturing Company, Cleveland, Ohio; J. E. Madore, Cherry River Paper Company, Richwood, W. Va.; C. J. McMahon, Kalamazoo, Mich.; Peter J. Massey, W. F. Hall Printing Company, Chicago; W. F. McClellan, Lafayette Box & Paper Company, Lafayette, Ind.; J. F. McKenzie, Don Valley Paper Company, Toronto, Canada; Wm. MacGregor, Bemis Bros. Bag Company, Peoria, Ill.; E. R. MacLaren, Albany Felt Company, Albany, N. Y.; Carl Magnus, Standard Paper Manufacturing Company, Richmond, Va.; George J. Maye, Hooker Electrochemical Company, Niagara Falls, N. Y.; H. C. McDaniel, Waldorf Paper Products Company, St. Paul, Minn.; Ed. McWhirter, Provincial Paper Mills, Georgetown, Ont.; John J. Meyer, Menasha Printing and Carton Company, Menasha, Wis.; Elbert G. Milham, Bryant Paper Company, Kalamazoo, Mich.; A. A. Mintle, The Valve Bag Company, Oakmont, Pa.; L. M. Mongreig, United States Rubber Company, Detroit, Mich.; A. E. Montgomery, J. O. Ross Engineering Corporation, Chicago; Don H. Montville, Shartle Bros. Machine Company, Middletown, Ohio; Arthur J. Monro, Buffalo, N. Y.; Chas. N. Mooney, Smith Paper Company, Lee, Mass.; T. H. Morrissey, Shuler & Benninghofen, Hamilton, Ohio; Jos. A. Moses, Falulah Paper Company, Fitchburg, Mass.; T. J. MacMullin, Paper Makers Chemical Company, Holyoke, Mass.; W. A. Munro, Munising Paper Company, Munising, Mich.; F. S. Murphy, Lockport Felt Company, Appleton, Wis.; L. T. Murphy, Franklin Board & Paper Company, Franklin, Ohio; J. A. Murray, Wm. A. Hardy & Sons Company, Fitchburg, Mass.

A. G. Natwick, Lincoln Pulp & Paper Co., Ltd., Merritton, Ont.; J. D. Nevelle, Eddy Paper Corporation, Three Rivers,

Mich.; N. J. Niks, Chillicothe Paper Company, Chillicothe, Ohio; C. H. Noble, A. E. Staley Manufacturing Company, Decatur, Ill.; J. H. Noble, Oliver Continuous Filter Company, New York; R. A. North, Green Bay Foundry & Machinery Works, Green Bay, Wis.; John J. Nylund, General Dyestuffs Corporation, Chicago.

E. O'Brien, Dells Paper & Pulp Company, Eau Claire, Wis.; J. H. O'Connell, Diana Paper Company, Harrisville, N. Y.; C. B. Oliver, United Filters Corporation, Chicago; Wesley M. Osborne, Newton Falls Paper Company, Newton Falls, N. Y.; Mark C. Osborn, Dilts Machine Works, Fulton, N. Y.; J. W. Outerson, Paterson Parchment Paper Company, Modena, Pa.

Jacob Parent, Western Board & Paper Company, Kalamazoo, Mich.; Harold J. Payne, Society for Electrical Development, New York; J. H. Pauli, Butler Paper Company, Detroit; Frank E. Pearson, Munising Paper Company, Munising, Mich.; R. A. Peterson, Valley Iron Works Company, Appleton, Wis.; Jay D. Peters, Albany Felt Company, Albany, N. Y.; M. W. Phelps, Lincoln Pulp and Paper Co., Ltd., Merritton, Ont.; A. McPhillips, R. J. Dowd Knife Works, Beloit, Wis.; Wayne A. Pitts, York Haven Paper Company, York Haven, Pa.; Theo. M. Pomeroy, Z. & W. M. Crane, Inc., Dalton, Mass.; L. D. Post, New York; H. G. Potts, Pennsylvania Salt Manufacturing Company, Wyandotte, Mich.; Walter L. Potts, Mid-West Box Company, Circleville, Ohio; George H. Pountain, Kalamazoo, Mich.; Max Poyck, The Heller and Merz Company, New York; Ross Pruette, Manchester Board and Paper Company, Richmond, Va.; Elton L. Puffer, Heller and Merz Company, New York; W. M. Purdy, Gerrard Wire Tying Machine Company, Chicago.

J. U. Raines, Provincial Paper Mills, Thorold, Ont.; C. T. Ramsden, Beloit Iron Works, Beloit, Wis.; James G. Ramsey, Dill & Collins, Philadelphia; G. F. Reale, Hooker Electrochemical Company, New York; P. L. Redlich, Robospray Manufacturing Company, Chicago; Michael Redmond, Kalamazoo Paper Company, Kalamazoo, Mich.; H. J. Reed, Improved Paper Machinery Company, Nashua, N. H.; Wm. Reltig, The Gardner-Harvey Company, Middletown, Ohio; John J. Reynolds, Federal Paper Board Company, Bogota, N. J.; Carl F. Richter, Vera Chemical Corporation, Stoneham, Mass.; A. Wm. Riedel, Gus Riedel & Son, Detroit; Fred G. Risser, Consolidated Water Power & Paper Company, Stevens Point, Wis.; Ernest B. Roberts, Bemis Brothers Bag Company, Peoria, Ill.; Wm. J. Robertson, Heller & Merz Company, New York; Fred J. Rooney, The Upson Company, Lockport, N. Y.; Edward Rootes, Chicago Mill & Lumber Company, Chicago; Geo. Roschek, Eagle Paper Company, Joliet, Ill.; Harry M. Ross, Beveridge Paper Company, Indianapolis; R. S. Ross, Beveridge Paper Company, Indianapolis.

James Salter, Victoria Paper Mills, Fulton, N. Y.; Thomas H. Savery, Jr., Chicago; C. A. Silvis, Itasca Paper Company, Grand Rapids, Minn.; J. R. Scheel, Acme Steel Company, Chicago; Herman W. Schlosser, Ajax Paper Manufacturing Company, New Orleans, La.; D. E. Scott, The Adams Bag Company, Chagrin Falls, Ohio; W. H. Scott, Duriron Company, Dayton, Ohio; R. E. Sears, Shartle Bros. Machinery Company, Middletown, Ohio; J. W. Shanley, Simonds Saw & Electric Company, Detroit; Edward Sheahan, Manistique Paper and Pulp Company, Manistique, Mich.; P. J. Sievert, M. & M. Paper Company, Marinette, Wis.; W. H. Sievert, Michigan Carton Company, Battle Creek, Mich.; A. W. Simpson, De Grasse Paper Company, Pyrites, N. Y.; H. A. Skinner, Marathon Paper Mills Company, Rothschild, Wis.; C. B. Smith, Sandoz Chemical Works, Chicago; P. A. Smith, Combined Locks Paper Company, Appleton, Wis.; Jack Smith, The Gardner-Harvey Company, Middletown, Ohio; Ward M. Smith, Philadelphia Paper Manufacturing Company, Manayunk, Pa.; J. Norman Spawn, Champion Fibre Company, Canton, N. C.; A. O. Spierling, Hammermill Paper Company, Erie, Pa.; R. J. Sprang, The Champion Fibre Company, Canton, N. C.; Howard Stansell, West Carrollton Parchment Company, West Carrollton, Ohio; Edward L. Stansel, Provincial Paper Mills, Ltd., Mille Roches, Ont.; B. K. Steadman, Standard Paper Manufacturing Company, Richmond, Va.; Geo. W. Sterrett, National Biscuit Company, Marseilles, Ill.; L. S. Territt, Paper Makers Chemical Company, Holyoke, Mass.; R. C. Stewart, Shartle Bros. Machinery Company, Middletown, Ohio; E. H. Stoddard, Appleton Woolen Mills, Appleton, Wis.; G. E. Stoke, Tomahawk Kraft Paper Company, Tomahawk, Wis.; A. G. Stone, Marinette & Menominee Paper Company, Marinette, Wis.; J. J. Sullivan, Hopper Paper Company, Taylorville, Ill.; T. F. Sullivan, Eddy Paper Corporation, Three Rivers, Mich.; W. P. Sullivan, Ruberoid, Joliet, Ill.; Wm. H. Sutherland, Pennsylvania Fibre Board Company, Inc., York, Pa.; Wm. Swartz, Ohio Box and Board Company, Rittman, Ohio; O. G. Squires, Shuler & Benninghofen, Hamilton, Ohio.

A. A. Tanyane, Paper Trade Journal, New York; Alden R. Taylor, Wm. L. Barrell Company, Boston, Mass.; W. A. Taylor, LaMotte Chemical Products Company, Baltimore, Md.; H. E. Teter, Mead Pulp & Paper Company, Chillicothe, Ohio; E. L. Tewksbury, Stone & Woodward Company, Newton Upper Falls, Mass.; L. N. Thompson, Paper Makers Chemical Company, Holyoke, Mass.; Frank J. Timmerman, Northern Paper Mills, Green Bay, Wis.; P. Y. Tumy, General Electric Company, Grand Rapids, Mich.

L. R. Verdon, Paper Mills Supply Co., Kalamazoo, Mich.; George Voight, Wausau Sulphate Fibre Co., Mosinee, Wis.

C. K. Wadham, Z. & W. M. Crane, Inc., Dalton, Mass.; J. J. Wall, General Electric Company, Milwaukee; R. J. Wainwright, Price & Pierce, Ltd., New York; George K. Walker, Finch, Pruyn & Co., Glen Falls, N. Y.; W. J. Weed, Electro Bleaching Gas Company, New York; L. Vincent Welch, Union Screen Plate Company, Fitchburg, Mass.; Fred B. Wells, Ohio Box Board Company, Rittman, Ohio; S. Carroll Wentz, P. H. Glatfelter Company, Spring Grove, Pa.; William B. West, E. D. Jones & Sons Company, Pittsfield, Mass.; Washburg Weston, American Wringer Company, Woonsocket, R. I.; Seth Wheeler, Jr., A. P. W. Paper Company, Albany, N. Y.; Charles W. Whitaker, Natick Box & Board Company, Natick, Mass.; C. W. Whitehouse, P. C. K. Company, Fulton, N. Y.; Frank A. Whittinger, General Dyestuffs Company, Chicago; A. F. Wilcox, United States Rubber Company, Chicago; S. L. Willson, American Writing Paper Company, Holyoke, Mass.; Lee L. Wilson, Morris Paper Mills, Morris, Ill.; Ray F. Wilson, Ft. Wayne Cord Paper Company, Hartford City, Ind.; M. P. Wingate, Albany Felt Company, Albany, N. Y.; Jas. H. Wright, Cabble Wires and Appleton Felts, Kalamazoo, Mich.

E. F. Yahnke, Standard Paper Company, Kalamazoo, Mich.; S. P. Yordy, Howard Paper Company, Urbana, Ohio; John F. Yordy, Howard Paper Company, Urbana, Ohio; G. H. Young, Fulton Engineering Company, Middletown, Ohio; C. E. Youngschild, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; W. A. Yule, F. C. Huyck & Sons, Albany, N. Y.

The Industrial Executive

In writing this book Mr. B. A. Franklin, Vice-President, Strathmore Paper Co., had two main purposes in mind. The first was to present a review of the main elements, the underlying principles of the executive's job, in the hope that it might prove valuable and inspiring to improvement. This thought has to do with executives, principals and subordinates, in whose hands rests very largely the highest development of industry.

The second idea has to do with industry as a whole in the service that it renders—service that it renders to the public through the production of goods, and service to those employed by and dependent upon it.

The book is an attempt to consider industry from the point of view of its purpose, its economies, its economics and its ideals. It is written in an interesting educational style, by a man well qualified to write of such a subject, and should make a welcome addition to the executive's library.

The book is published by the Ronald Press Co., 15 East 26th St., New York City, and the price is $1.25.

Harry E. Weston, who for some years has been assistant professor of pulp and paper manufacture at the New York State College of Forestry, connected with the Syracuse University, Syracuse, N. Y., has severed this connection to become associated with Thomas H. Savery, Jr., of Chicago, in the sale of paper mill machinery.

The R. H. Beaumont Co., Philadelphia, Pa., announces the opening of a western branch at 1544 Strauss Bldg., Chicago, Ill. Mr. H. E. Birch, formerly sales manager at Philadelphia, will be in charge.

Canadians Hold Joint Summer Meeting

Technical Section of Canadian Pulp and Paper Association Hold Summer Meeting Jointly With Canadian Chemists

IN VIEW of the fact that a "Cellulose Symposium" was included in the program of the Ninth Dominion Convention of Chemists, the technical section of the Canadian Pulp and Paper Association were invited to participate in the convention. As a result, the whole day of Wednesday, June 2nd, was devoted to the Cellulose Symposium under the chairmanship of Prof. Harold Hibbert, of McGill University; while the next morning was given over to a roundtable discussion of sulphite cooking, under the chairmanship of Prof. H. O. Keay, of Laurentide Co., chairman of the technical section of the C. P. & P. A., the afternoon being left open for those who wished to enjoy a game of golf at the Senneville Country Club.

One of the outstanding features of the convention was the exhibition of chemical products and laboratory supplies, which had been prepared with much care and were displayed to great advantage. The pulp and paper and related industries were well represented, and their exhibits drew many favorable comments from the numerous visitors. Among these exhibitors were: Brompton Pulp and Paper Co., with exhibits of kraft, sulphate paper and pulp; Canada Paper Board Co., paper board; Canadian Celanese, Ltd., "celanese" rayon; Canadian Pulp and Paper Association, pulp and news print; Courtalds Limited (Canada), viscose rayon and textiles made therefrom; Howard Smith Paper Mills, Ltd., fine papers; Interlake Tissue Mills Co., Ltd., tissue papers and articles made from them; Lincoln Mills, Ltd., fine papers; Riordon Sales Corp., Ltd., rayon wood cellulose and bleached sulphite wood pulp; Rolland Paper Co., Ltd., fine papers; Walker Co., artificial wood products.

Public Lecture on "Rayon"

In a most interesting public lecture, Dr. W. H. Charch, of the DuPont Rayon Company, reviewed the history of attempts to produce artificial threads suitable for the manufacture of textiles which could compete with natural silk and other natural textile materials, and briefly outlined the various processes which are used at the present time for the commercial production of such threads from cellulose. He then went on to describe at considerable length the manufacture of viscose, starting from the cutting down of the woods in the forests of Northern Canada, through the conversion of the wood into high grade bleached sulphite pulp, which in turn is treated with caustic soda solution and carbon disulphide, allowed to mature, and then converted into filaments by discharging under high pressure through very fine nozzles into a coagulating or precipitating solution. The lecturer described the various properties of the material and showed numerous interesting specimens of the wide variety of products which are now being made from viscose. The lecture was illustrated by a large number of slides showing the manufacture of high grade bleached sulphite as carried out at the Kipawa mill of the Riordon Pulp Corp., a subsidiary of Canadian International Paper Co., and the manufacture of viscose as carried out at the plant of the DuPont Rayon Co.

CELLULOSE SYMPOSIUM

In opening the Cellulose Symposium, Prof. Hibbert stated that the purpose of the symposium was to draw the attention of all, scientists and laymen alike, to the tremendous possibilities which lay in the cellulose resources of Canada. These can best be put to account through intense scientific and technical research which would show how wood pulp can be substituted for cotton in the preparation of an almost unlimited number of products which are of much greater value than paper.

X-Ray Analysis of Cellulose Derivatives

Prof. A. S. Eve, Director of the Department of Physics at McGill University, gave a short address on "X-Rays and Their Application to Chemistry," and Prof. A. N. Shaw on "X-Rays and Crystal Structure." These two short talks, which were illustrated by experiments, models and slides, served as introduction to Prof. R. O. Herzog's lecture on "The Bearing of X-Ray Analysis on the Constitution and the Technical Application of Cellulose Derivatives."

By utilizing the experimental laboratory procedure as well as the industrial X-ray technique so conspicuously developed during the last few years, Prof. Herzog and his collaborators have found it possible to show that cellulose is composed of minute crystals lying beyond the range of microscopic visibility, and that it exhibits the same X-ray interference phenomena as found with crystalline substances. The data obtained in the course of numerous experiments indicate that mature cellulose belongs to the rhombic system of crystal-symmetry; and it has been possible to calculate the length of the edges of the crystallographic cell, and also to calculate that the unit cell contains four $C_6H_{10}O_5$ groups. Cellulose acetate, on the other hand, contains 16 of the $C_6H_7(C_2H_3O_3)_3O_2$ groups in the cell unit, while nitrated cellulose contains 32 $C_6H_7(NO_3)_2O_3$. The results given would make it seem probable that the crystals of the grown cellulose are under tension along the fiber axis.

Though the chemical assumption that all the glucose groups may be attached glucosidically to one another is not excluded, yet this is not considered likely, and it seems more probable that a number of $C_6H_{10}O_5$ groups are linked together according to Werner's theory of secondary valencies. Researches on infrared absorption spectra of cellulose using fluorite-disperson carried out recently indicated that it is unlikely that a change takes place in the chemical constitution of the cellulose during mercerization.

Dr. Essenlen was desirous of knowing why, if starch and cellulose have the same crystalline structure, starch does not have the fiber structure of cellulose. Dr. Herzog explained that this was due to the twofold reason that starch is an entirely different chemical substance from cellulose, and that the arrangement or orientation of the cell units was different, the cellulose units lying end to end to form closely associated filamentous structures, while the starch units were oriented in all directions. In reply to Mr. J. N. Stephenson's inquiry as to the effects of the presence of foreign intercellular bodies in materials such as wood pulp, Prof. Herzog stated that amorphous substances render X-ray diagrams indistinct.

Some Pulp and Paper Making Problems

In his paper on "Some Fundamental Problems in Pulp and Paper Making," Dr. B. Johnsen, of Hammermill Paper Co., Erie, Pa., chose a few practical examples to bring out the necessity for very extensive research of a fundamental nature of the raw materials used in the industry and of the processes in which these materials are used. Much has been done along these lines, particularly in the scientific institutions of Europe; but still more remains to be done. The value of the application of the results already obtained is not realized to as great an extent as it should be in the mills; but where it has been properly understood and where the services of trained chemists and chemical engineers have been employed, it frequently has resulted in the development of technical control of processes, a better understanding of the processes, and improvement and greater uniformity of quality, without which the greatly increased production per unit of equipment which has taken place in the course of the last few years would have been impossible.

Fermentation of Cellulose and Derivatives

At the afternoon session, Prof. Horace B. Speakman, of the University of Toronto, spoke on "The Fermentation of Cellulose and Its Derivatives." He considered the utilization of these substances by unicellular organisms chiefly in connection with the production of certain substances of economic importance, such as ethyl alcohol, acetic acid, acetone and butyl

alcohol. He found among other interesting things, that ordinary sulphite waste liquor contains traces of very powerful poisons, that the poisonous effect is not equal on cells of different ages, and that by treatment the toxicity of the fluids can be reduced.

In commenting on the paper, Prof. Hibbert suggested that if it were possible to ferment cellulose itself in wood, without having to remove the lignin, this would afford an ideal manner of preparing unchanged lignin whose constitution could then be studied. As matters stand at present, lignin is isolated by treatment of the material containing it with 72 per cent sulphuric acid, and it is only too likely that the lignin itself is affected. Unfortunately the wood contains many substances which are toxic to the cellulose-fermenting organisms. The paper, concluded Dr. Hibbert, gave an insight into the present undreamed-of possibilities ahead of cellulose as the basis of new organic chemical indutries.

Colloidal Characters of Cellulose

Prof. Herzog, in his paper on "Recent Developments Relating to the Colloidal Characters of Cellulose," stated that, while X-ray examination furnishes some information as to the structure of the fiber, the arrangement, the size, and to a certain extent the form, of the crystallites, it was of importance to verify such observations on the size of the particles by means of other methods. The results obtained by the newer technique of colloid chemistry concerning the arrangement and form of the crystallites agree with the conclusions arrived at by the botanists (Ambronn, Frey) from their microscopical studies, especially those concerned with double refraction, and from them Prof. Herzog formulates the following views on the structure of cellulose fibers: "The smallest building units are the crystallites. These form thread-like secondary particles, which probably are held together by means of directed surface forces. The secondary particles cohere more or less by means of foreign substances (cementing substances) and the manner in which they are dispersed is of great importance in regard to the mechanical behavior of the fiber. In most cases, swelling and dispersion of cellulose appear to proceed step-wise; it first undergoes scission into secondary, and then into primary particles (crystallites). Under the influence of chemical forces, a further reduction in the size of the primary particles (crystallites) occurs.

A Talk on "Celanese"

Mr. R. G. Dort, of the British Celanese Co., gave a most interesting paper on "Celanese—A New Canadian Industry," in which he outlined the history and development of the manufacture of "celanese," or cellulose acetate rayon. The physical and chemical properties of the fiber and its general use and application for knitting and weaving were described, and Mr. Dort dwelt at some length on the difficulties encountered in the dyeing of "celanese." These have now been overcome by the development of the so-called SRA dyestuffs, which show affinity only for the "celanese," so that it is possible to obtain two-effect dyeing of mixed fabrics in a single bath containing two different dyes, one for the "celanese," and the other for the other fiber.

Behavior of Cellulose on Heating

Dr. Bain's paper on "The Behavior of Cellulose on Heating" showed that the decomposition of cellulose at temperatures of 210° to 260° C. is progressive, and it is not yet known to what limit of time the heating may be carried on. The investigation up until the present has been almost entirely confined to the preparation and identification of the substances formed during the decomposition, which has proved to be very long and tedious. Glucose has been identified as one of the chief decomposition products, and other sugars are apparently absent. The acid formed is chiefly formic, with probably a small amount of acetic.

Problems in Wood Preservation

Mr. J. F. Harkom, of the Forest Products Laboratories of Canada, spoke on "Some Problems in Wood Preservation," bringing out the necessity of wood preservation, the requirements of a suitable preservative agent, the technical and economic factors which have militated to restrict the application of preservative treatments, and suggesting lines along which further endeavor should be directed in this field of research.

The last two papers of the symposium dealt with cellulose and the lacquer industry. Mr. J. Boiseau Wiesel, of the Hercules Powder Co., discussed the manufacture of nitro-cellulose suitable for use as a lacquer, the essential perequisite of which is low viscosity when in solution in a suitable solvent. This is a very recent development, as it is only a few years ago that it was found possible to treat low-nitrogen nitro-celluloses so as to reduce their viscosities to the required degree. Mr. Arthur Orr, of the Commercial Solvents Co., treated of the preparation of these cellulose lacquers, describing the properties required of the various raw materials and discussing at some length the formulation of selection and proportioning of the various ingredients for the manufacture of lacquers for various specific purposes.

DISCUSSION ON SULPHITE MANUFACTURE

In starting the discussion on Sulphite Manufacture, Mr. E. P. Cameron, of the Forest Products Laboratories at Montreal, stated he merely wished to make a few suggestions which he would like to see criticised and discussed. The two main points requiring attention at the present time are the cooking process and methods of analysis. As regards the first, Mr. Cameron's conception of the problem is to work out the relation between the physical-chemical properties of the acid and the degradation of the wood substance, and from that trace the relation between the components of the liquor and the cooking conditions. The best method of tackling the problem lies in carrying out a large number of experimental cooks, under as closely regulated conditions as possible, so as to eliminate as many variables as possible, these cooks being interrupted at various stages in the process and the contents of the digester, both acid and wood or pulp, being examined. As to methods of analysis, unification and standardization are urgently needed so that the interpretations of results obtained by different investigators may be comparable. It would be advisable, in Mr. Cameron's opinion, to adopt such methods without delay, even though the methods adopted might not be all that should be desired, as it is essential that work done in different places may be compared. This would not prevent a more thorough scientific investigation of analytical methods, based on better knowledge of the constituents being investigated.

Hovey Speaks on News Grade Sulphite

Mr. R. W. Hovey, of the Abitibi Power & Paper Co., considered the matter purely from the standpoint of newsprint manufacture. The requirements for sulphite to be used in the manufacture of news are fiber length, strength, cheapness, and, to a minor extent, color. It is not necessary to get a pure cellulose, because the presence of lignin and other carbohydrates are not detrimental in the manufacture of news. The essential point in the manufacture of news grade sulphite is not to isolate cellulose, but to isolate strong fibers, and to increase the yield, thereby lowering the cost per ton of pulp. This end may be brought nearer by a thorough knowledge of the rate of penetration of the chips by the liquor, and of the rate at which the reactions take place in the digester.

O. F. Bryant Suggests Fields of Investigation

Mr. Bryant, of the Laurentide Co., remarked that conditions had changed greatly in the industry during the last few years. Formerly, the chief consideration was to get out the tonnage, and the yield obtained from the wood was of secondary importance; at present, tonnage has not lost any of its importance, but the tremendous increase in the cost of raw materials has given even greater importance to the question of yield. Every mill must strike its own balance between these two factors, so as to operate under most economical conditions. As a result we find a very wide range of cooking conditions, there being hardly two mills which carry out the process in exactly the same way. Yet all seem to be turning out a marketable product of approximately the same quality. An invesitgation of what is going on in the digester would doubtless shed some light on the reasons for this. Mr. Bryant suggested that penetration of the chips by the liquor might be the basic factor involved. Other interesting fields of investigation would be the causes of variations in qualites of products obtained from different woods, more particularly spruce and balsam fir, and also the properties required in the finished product (that is,

the sulphite pulp) according as to whether it will be used for news, wrappings, bonds, rayon, etc.

Dr. Bates Relates Interesting Experiences

Dr. J. S. Bates, of the Bathurst Co., gave some very interesting information on some experiences at the Bathurst mill. Here, both kraft and sulphite pulps are manufactured, and a considerable amount of the latter is sold for the manufacture of better grades of paper than news. It occurred to him that a saving could be effected by substituting lime-sludge from the kraft mill for the high-magnesia lime which they had been using in their Barker milk of lime system for the manufacture of their acid liquor. The experiment proved quite successful, both as regards the preparation of the acid and as regards its use in cooking, little measurable difference in quality being observed in the pulp. In regard to steam consumption in cooking, Dr. Bates thought there was room for considerable improvement in the sulphite process. At Bathurst, sulphite cooking requires about 2,000 lbs. of steam more than kraft. He suggested that this might be due to the greater volume of liquor used in the sulphite process, and a contributory cause lay in the poor utilization of the heat. The relief, for instance, is cooled down thoroughly before absorbing into the raw acid, and when it is put back into the digester in the form of cooking acid it must be heated up again. Direct recovery of the heat contained in the gas and liquor reliefs would help to reduce steam consumption. As to control of the digesting, this could probably be improved by reducing the volume of liquor and weighing the chips as they go into the digester.

According to Mr. Tomlinson, circulation is a very important factor in cooking. Proper circulation in the digester will give a more uniform product and at the same time will permit of cooking in a shorter time.

Durgin Describes Some Puzzling Problems

Mr. A. G. Durgin, of the Spanish River Pulp and Paper Mills, mentioned a couple of the questions which were puzzling sulphite manufacturers, such as the cause of liming up of the blow pits, what happens to the sawdust in chips in the cooking process, and difficulties in maintaining uniform acid conditions due to various moisture contents of the wood, the relation between circulation and penetration, and the differences in yield obtained from digesters of different sizes under apparently the same cooking conditions. In one of their mills Spanish River had tried out the use of a very high-magnesia lime (containing about 85 per cent of magnesia), and encountered no trouble in the preparation of the liquor or in the cooking of the wood; but in a very short time there formed such a deposit of silica on the flat screens that the use of this lime had to be discontinued.

W. E. B. Baker Speaks of European Methods

Mr. W. E. B. Baker, of the Continental Paper and Bag Mills, discussed the relative consumptions of steam and chemicals in Europe and on this continent, and considered that the lower consumptions generally observed in Europe are attributable partly to the higher average density of the wood over there, and partly to the longer cooking period. He suggested that it would be both interesting and profitable to study the sulphite cooking process along the lines of the work recently carried out by Arrhenius with the sulphate and soda processes, in which he worked out the rate of reaction of the solution of cellulose and of incrusting matter.

Effects of Variations in Moisture Content of Wood

Mr. C. N. Candee, of the Lincoln Pulp and Paper Mills, discussed the effects of variations in the moisture content of the wood, which are entirely out of proportion with the diluting action on the acid liquor of the water in the wood. This does not prevent the production of a fairly uniform quality of pulp; but uniformity is obtained only by considerably modifying the cooking curve. The pulp produced at the Lincoln mill with a 60-per-cent-magnesia lime is very easily hydrated, and Mr. Candee attributes this to the action of the magnesia.

In reply to Mr. Candee, Dr. Johnsen said that ease of hydration is probably due to the presence of non-cellulose constituents, or possibly to poor quality of wood.

Good Results from Close Control of Process

Mr. F. L. Mitchell, of the Abitibi Power & Paper Co., spoke of the good results obtained at Iroquois Falls by close control of the process, the yield having been increased quite appreciably, while at the same time the quality of the pulp was maintained. This has been accomplished by close control of the wood, which has eliminated one very important variable, and also by controlling the temperature at both the top and bottom of the digester by means of a two-pen recording thermometer. Variations of as much as 20 to 30 degrees are observed between the two at the beginning of the cook, and of 5 to 8 degrees at the end. Proper circulation, as indicated by the two-pen thermometer, is reflected in the strength and freeness of the fiber, showing this to be an important factor in variations in fiber quality. One other factor which has contributed to increasing the yield without detriment to the quality has been thorough cooling of the relief, the liquor and gas reliefs being kept separate.

Dr. Hibbert spoke briefly on the fundamental characteristics of the process from the purely scientific standpoint, and stressed more particularly the importance of a thorough study of the properties of the raw materials. In order to prepare iron-free alum it is essential to know the properties of iron; and similarly, in order to produce a pure cellulose it is just as important to know the properties of lignin.

MacNaughton Congratulates Members

In conclusion, Mr. W. G. MacNaughton, secretary of T. A. P. P. I., congratulated the members on the numerous interesting points brought up for discussion. The solution, partial or total, of these various problems can best be reached by co-operation and exchange of ideas such as had just taken place. In order to carry on this exchange and co-operation throughout the whole year, and not restricting it merely to the occasions when members meet at conventions, the technical association had formed a service to members committee, the function of which was explained by Mr. MacNaughton. He took pleasure in extending this service to those members of the technical section who are not members of the technical association.

Among Those Present

W. H. Birchard, Forest Products Laboratories, Montreal; Dr. J. S. Bates, Bathurst Co., Ltd., Bathurst, N. B.; Dr. L. H. Baekeland, Baekeland Corp., Yonkers, N. Y.; W. E. B. Baker, Continental Bag & Paper Mills Corp., New York, N. Y.; Dr. Chr. Bay, Riordan Pulp Corporation, Hawkesbury, Ont.; O. F. Bryant, Laurentide Co., Grand'Mere, Que.

E. P. Cameron, Forest Products Laboratories, Montreal; W. B. Campbell, Forest Products Laboratories, Montreal; W. N. Candee, Lincoln Pulp and Paper Mills, St. Catherine, Ont.; W. Hale Charch, DuPont Rayon Co., Buffalo, N. Y.; T. L. Crossley, Toronto, Ont.; Dr. J. Campbell, Abitibi Power & Paper Co., Iroquois Falls, Ont.; E. K. Carver, Eastman Kodak Co., Rochester, N. Y.; D. Crabtree, Montreal West.; A. P. Costigane, Ontario Pulp and Paper Makers' Safety Association, Toronto, Ont.; H. J. C. Chapman, Abitibi Power & Paper Co., Iroquois Falls, Ont.

R. G. Dort, New York, N. Y.; A. G. Durgin, Spanish River Pulp and Paper Mills, Sault Ste. Marie, Ont.

W. F. Edwards, New York, N. Y.; J. G. Esselen, Cambridge, Mass.

J. E. Fleury, School of Pulp and Paper Making, Three-Rivers, Que.; J. Funcke, Riordan Pulp Corp., Hawkesbury, Ont.

C. R. Hazen, Montreal; Prof. Oliver Herzog, Faserstoff Institute, Berlin-Dahlem, Germany; Dr. H. Hibbert, McGill University, Montreal; F. C. Hahn, Wilmington, Del.; Dr. Marta Helma, "Die Kunstseide," Berlin, Germany; J. J. Harpell, Gardenvale, Que.; R. W. Hovey, Abitibi Power & Paper Co., Iroquois Falls, Ont.

R. C. Griffin, A. D. Little, Inc., Cambridge, Mass.; C. Nelson Gain, Interlake Tissue Mills, Merriton, Ont.; H. LeB. Gray, Eastman Kodak Co., Rochester, N. Y.

Dr. B. Johnsen, Hammermill Paper Co., Erie, Pa.

M. A. Krimmell, Hammermill Paper Co., Erie, Pa.; E. O. Kraemer, Madison, Wis.; Prof. H. O. Keay, Laurentide Co., Grand'Mere, Que.; R. S. Kellogg, News Print Service Bureau, New York, N. Y.

Norman Linnett, Courtauld's Ltd., Cornwall, Ont.; Wm. Lodge, Forest Products Laboratories, Montreal.

F. G. Marriott, Forest Products Laboratories, Montreal; F. L. Mitchell, Abitibi Power & Paper Co., Iroquois Falls, Ont.; A. R. M. MacLean, Montreal; W. G. MacNaughton, Secretary of T. A. P. P. I., New York, N. Y.; C. K. McLeod, Chemical Engineering Equipment Co., Montreal; Ragnar Munnberg, Spruce Falls Co., Kapuskasing, Ont.; Wm. C. Munroe, Three-Rivers, Que.

G. Niklasson, St. Andrews East, Que.

A. Papineau-Couture, Montreal; Dr. John L. Parsons, Hammermill Paper Co., Erie, Pa.; Dr. O. S. Pokorny, Riordon Pulp Corp., Temiscamingue, Que.

D. E. Read, Brompton Pulp & Paper Co., East Angus, Que.; Dr. R. F. Ruttan, McGill University, Montreal; H. J. Rowley, Cambridge, Mass.

F. G. Stantial, Merrimac Chemical Co., Boston, Mass.; J. N. Stephenson, Editor of Pulp and Paper Magazine, Gardenvale, Que.; J. S. E. Shotwell, Forest Products Laboratories, Montreal.

M. R. Trimmer, Celluloid Co., Newark, N. J.; J. Thue, Riordon Pulp Corporation, Hawesbury, Ont.

S. Wang, Riordon Pulp Corporation, Hawkesbury, Ont.; C. L. Waterous, Waterous Limited, Brantford, Ont.; J. B. Wiesel, Hercules Powder Co., Wilmington, Del.; K. G. Wilen, Wayagamack Pulp and Paper Co., Three-Rivers, Que.

J. G. Esselen, Cambridge, Mass.

Paperboard Industries Association Holds Meeting

Members of Paperboard Industries Association met at the New Palmer House, Chicago, in Group Sessions on Wednesday, May 26th, morning and afternoon, and on Thursday morning, May 27th, followed by joint session with the members of the three groups in attendance on the afternoon of Thursday, May 27th.

President Fletcher M. Durbin presided at the general meeting, while the group meetings were presided over by the following officers:

Folding Box Group—A. C. Osborn, Vice-President.

Paperboard Group—W. J. Alford, a member of the Executive Comittee.

Container Group—J. P. Brunt, Vice-President.

The general meeting was devoted to reports and discussions of subjects of general interest to the three groups. Reports were submitted at this meeting by the officers who presided at the individual group meetings. By means of these reports all members were promptly informed of matters that are being considered by the different groups. President Durbin addressed the membership on the subject of conditions now obtaining in the industry. His plea was that every member co-operate to the extent of giving at least a part of his time towards the success of the Association.

Chairman J. P. Brunt, of the Sales Promotion Committee, reported on the Association's effort to increase the use of corrugated and solid fibre boxes and folding cartons. The reports showed that headway is being made. Reports were then submitted by the Research Committee, Statistical Committee and a report on General Association Activities, by General Manager Browder, concluded the General Meeting.

Group Meetings

The Folding Box Group met on the morning of Wednesday, May 26, with Vice-President A. C. Osborn presiding. The principal topic for discussion was a memorandum which had been prepared by Geo. W. Gair, in which he depicted conditions now obtaining in the paperboard industries. This presentation brought forth much constructive comment.

As in the Folding Box Group meeting, the principal topic of discussion at the Paperboard Group meeting, was the memorandum prepared by Mr. Gair. At the suggestion of E. R. Hankins, Chairman of the Statistical Committee, the Paperboard Group adopted several minor changes in the form of the statistical reports, the idea being to make the reports of the greatest value to the group.

Vice-President Brunt presided at the meeting of the Container Group meeting. There was a good attendance, practically all members taking part in the deliberations. General Manager Browder explained in detail the changes to be published in a Supplement to Consolidated Freight Classification to be issued about Sept. 1, which will open up additional business for the industry. Mr. Browder also reported upon new materials to be authorized for use in the corrugated sheet of boxes, partitions, liners, wrappers, etc. The report on inspection service elicited much comment.

Next Meeting

The next meeting of the Association will be held at the Roosevelt Hotel, New York City, in July, as per the following schedule:

Tuesday, July 20, 1926—Meeting of Executive and Standing Committees.

Wednesday, July 21, 1926—(morning) Folding Box Group meet; (afternoon) Paperboard Group meet.

Thursday, July 22, 1926—(morning) Meeting of Container Group; (afternoon) meeting of the Three Groups in Joint Session.

The Associaition Meeting was well represented by members of participating firms. Applications for membership from the David M. Lea & Co., Inc., Richmond, Va. to the Container (Corrugated) Group, and of the Robertson Paper Co., Montville, Conn. to the Paperboard and Folding Box Group, were presented and unanimously elected.

Tappi Fall Meeting in York, Pa.

At a meeting of the Executive Committee of TAPPI, held in New York recently, it was decided to accept the invitation of the members in York, Pa., to hold the fall meeting there, September 14, 15 and 16, 1926. The forenoons of these dates will be devoted to discussions of practical manufacturing problems and the afternoons to mill visits. On account of the diversity of paper manufacture in and around York, an extremely interesting and valuable convention is expected.

It is planned, in addition, to visit the mills of P. H. Glatfelter Company, Spring Grove, Pa., where many new developments have been made in recent years; also the plant of York Haven Paper Company, York Haven, Pa., with which W. E. Byron Baker, a member of the Executive Comimttee, was formerly closely identified.

The local committee in charge of arrangements includes: P. H. Glatfelter, Chairman; W. E. B. Baker, W. S. McClellan, W. A. Pitts and H. D. Schmidt.

Summer Courses in Pulp and Paper Making

The University of Maine, Orono, Maine, announces that as during many previous years, it will conduct a number of courses in chemistry and pulp and paper manufacture from June 28 to August 6, 1926.

The summer work is in charge of Dr. Charles Andrew Brautlecht, professor of chemistry, and the pulp and paper courses will be given by Paul DeCosta Bray, associate professor of chemistry in charge of pulp and paper work, who was for eight years chemist and assistant sulphite superintendent of the Katahdin Division of the Eastern Manufacturing Company. He will be assisted by Alexander Braun Cutler, assistant instructor in paper chemistry and paper technology. In addition, if there is sufficient demand, other paper specialists will be obtained to give lectures on specific pulp and paper topics. Visits to all kinds of pulp and paper mills in the vicinity of Orono will be made on Saturdays. These will include groundwood, soda, bleached and unbleached sulphite and kraft pulp mills, as well as newsprint, specialty, fine writing and kraft paper mills.

Those interested in taking these courses should write at once to make reservations, to Prof. C. A. Brautlecht, Chemistry Department, University of Maine, Orono, Maine.

A. George Lutz, paper mill sales agent, Brooklyn, N. Y., announces the opening of a branch office at 200 Fifth Ave., New York City.

E. A. Smith, formerly sales engineer with the Hill Clutch Machine and Foundry Co., announces the formation of the Engineering Sales Corporation, with offices in the Perry-Payne Bldg., Cleveland, Ohio. The new organization are contracting engineers and distributors of industrial equipment.

Partial Report of the Committee on White Water Waste[1]

Processes in Different Mills Outlined and the Practical Experience of the Superintendents

Report on White Water

By H. W. SERVER, Chairman
Miami Paper Co., West Carrollton, Ohio

THE white water problem has been studied for years by many pulp and paper manufacturers in the United States and, I might say, the entire world.

From a manufacturing standpoint much has been done and very gratifying results have been obtained; but many mills are still losing large quantities of valuable material because of the lack of the proper incentive to analyze the mill effluent to ascertain just what these white water losses amount to in dollars—not cents—for just one month—I imagine the results would be staggering.

I have in mind a certain mill who were, seemingly, painstaking in their practices and handling of white water. They consulted with nationally known engineers on this problem, finally selecting what was thought to be the last word for recovery of white water losses. They had gone to great expense to install what was expected to be the most efficient equipment obtainable, yet, recent survey disclosed the fact that there were times when white water losses or shrinkage amounted to two dollars ($2.00) per ton of finished product. The raw stock in this case was all bleached stock and cost 4 cents per pound. On this basis a 50-ton mill would lose one hundred dollars ($100.00) per day and a 100-ton mill two hundred dollars ($200.00) per day and so on, assuming that this mill used 25,000 gallons of water per ton of finished product, this would mean that there was approximately 4 pounds of solids per 1,000 gallons of water in their mill effluent.

Every paper mill superintendent knows that the mill effluent is not the only place to have shrinkage.

Let us assume that we are analyzing a mill that is a converter mill. By this I mean a mill that purchased all their stock, which is delivered in rolls or bundles, you will find upon investigation that the shrinkage from wrapping and bailing wire will amount to approximately 2 per cent. On a 50-ton mill, this will amount to one ton per day, and at 4 cents per pound is $80.00. Then there are the Jordans, pumps, color changes, and leaks of every description that can not definitely be figured, but must be everlastingly watched, before the stock gets to the machine.

This stock is purchased on air dried basis, which means that it contains 10 per cent of moisture and theoretically will require 110 pounds of stock to make 100 pounds of finished product. Which, with the 2 per cent shrinkage for wrapping and bailing wire, gives a total of 12 per cent at the onset. This can be partly overcome or cut down by giving close attention to the moisture content in the finished product which may vary from 4 per cent to 5 per cent in book paper, to 7 per cent or 8 per cent in news. But as we are analyzing a book mill, we will say that 5 per cent is the proper amount of moisture that can be safely carried without fear of blackening, etc. This leaves 7 per cent shrinkage that you are sure to have regardless of your white water conditions and equipment.

It has been said that water is the cheapest conveyor that can be used in a pulp and paper mill. I also think it is the most expensive when it is conveying good fibre into the river.

The question is, how can we separate the fibre and valuable material from the water which is indispensable in the manufacture of paper. This must be done by concentration, by raising the 0.02 per cent solids in white water to a 2 per cent consistency, when it can be returned to the stock chests, without varying the weight on the machine.

I think all superintendents will agree that the most successful systems by which this can be accomplished is by means of what is termed by paper makers as—save-alls or sedimentation tanks. I have also seen this accomplished, more or less successfully, in fibre that contained no loading material, by means of flotation and skimming off processes. Air was forced down through a hollow shaft to a perforated runner in the bottom of a tank, the shaft and runner traveling at a very high rate of speed to cause violent agitation. However, the power and equipment required in this system were quite as costly as the loss of fibre, and the experiment was soon abandoned.

Two Types of Save-Alls

One writer in our report on white water places save-alls in two general types, which are the scheen type or sedimentation, or settling type.

The Screen Type.—The first is the screen type. This type, referring to the travel of the water, can be divided into the outward flow and the inward flow, the outward flow has a large capacity, but the efficiency is generally very low. They must depend upon gravity alone to cause the water to pass through the wire. If a wire fine enough to save the solids is put on, the machine almost ceases to function.

There have been many different types of the inward flow save-alls, such as the Bird, the American, Oliver, Pneumatic, etc. Some of these will guarantee an efficiency of 96 per cent by the addition of from 3 per cent to 5 per cent of fibre to the white water before passing through the save-all. This long fibre forms a film on the screen, making a perfect filtering medium, and will give a save-all effluent of 0.5 of a pound per 1,000 gallons of water so filtered.

Sedimentation Type.—The second general type of save-all is the sedimentation or settling type. This type has been in use in this country by some mills, making heavy clayed paper, for the past 20 years and much longer in foreign countries.

This type, when not crowded beyond its capacity, is very efficient. I have seen many tests taken that showed less than 0.5 pounds per 1,000 gallons in the clarified water.

They also have their disadvantage in that they must be cleaned regularly to avoid slime and corrosion. The piping also must be taken down and cleaned occasionally for the same reason.

The ideal system, to my mind, is the combined installation of the inward flow screen type save-all and sedimentation type, making the inward flow save-all an integral part of the paper machine, passing all the white water and stock from the couch pit of the paper machine, through the screen save-all, pumping the recovered fibre back to the machine chest, and using as much of the effluent from the screen save-all as possible on the showers, on the screens and wire of the paper machine, without injury to the clothing on the machine, the balance to the sedimentation tank for use in the beater room on beaters and Jordans. In this way it is possible to maintain what is known as a closed system.

The Closed System

There are some book mills who have de-inking plants in connection with their paper mills, who are successfully operating a closed system without returning any of the white water to the showers on the paper machine wire and screens and by using the inward flow save-all, returning the reclaimed fibre to the machine chest, using the clarified water as wash water in the de-inking plant. In this way, they are saving all the white water possible. You will find a great many obstacles

[1]Given at the Detroit Convention of the American Pulp and Paper Mill Superintendents' Association, June 3d, 4th and 5th, 1926.

and reasons for not using white water if you choose to look for them, and are easily persuaded or discouraged. But when you stop to think that the white water (if you have no save-all) contains from 6 to 10 pounds of solids or valuable paper making material per 1,000 gallons of water and if this is allowed to go to the sewer, it is a terrible loss—it is more than that—it is a calamity.

A 30-ton mill wasting 300 gallons per minute, at 6 pounds per 1,000 gallons would lose 100 pounds per hour, 2,400 pounds a day—assuming that the average cost is 4 cents per pound—would be very close to one hundred dollars ($100.00) per day, or thirty thousand dollars ($30,000.00) per year.

I have heard superintendents say they have no use for the technical man. Yet, I believe, the Superintendents' Association and the technical men themselves, by co-operation with the superintendent, is fast dispelling this idea. Personally, I think you can not work too close with your technical man, you should be pals. You need him, and he needs you, with your practical experience, and your company needs both of you.

It is an obvious fact that the majority of mills use too much water. This adds to the cost of pumping, filtering and furnishing fresh water, and increases the material losses because the excessive volume of water, the common carrier, goes down the sewer.

The production of all grades of paper in the United States for the year of 1925 was approximately 8,000,000 tons. Every one per cent saving means the conservation of 80,000 tons of material which, at an average figure of fifty dollars ($50.00) per ton, represents a saving of four millions dollars ($4,000-000). A conservative estimate indicates that an average reduction of at least 5 per cent of the waste losses is possible.

The question of mill effluent is closely allied to the stream pollution problem, which is becoming increasingly important. Legislative action is being strongly advocated in many sections and in some instances stream pollution laws have been passed and are rigidly enforced.

More complete utilization of white water will do much to prevent stream contamination, and tend to minimize the importance of the stream pollution problem.

White Water

Some Results Obtained Running on White Book and Envelope Papers

By S. C. WENTZ

P. G. Glatfelter Company, Spring Grove, Pa.

NO MORE important subject on waste material in the paper mill could be selected than that of the white waters.

It is only of late years that this occupied the attention of paper makers so much. Previous to this, enormous amounts went to waste. The stuff that went to the filler tank was only a small amount compared with the enormous amounts that could be saved. As prices of materials went up and profits down the business man amidst keener competition looked around for improvement that would bring them more profits. In the midst of installment of labor saving devices, they studied waste material of all sorts around the mill. One look at the hitherto despised drains showed enormous quantities of their best fibre with great amounts of filler going to waste. The study then became general and inventors and machine shops jumped at the chance to aid in putting on the market machines capable and incapable of helping the paper mills to save this material. Today the great question is to decide what save-all machines or systems are the best under various conditions. What ones will give the greatest good for the money outlay. The cost of some good machines would no doubt be out of the question in some of the mills. The ingenuity of the mill superintendents and mechanics greatly aided out a good save-all machine or system in producing better results.

It often seems to the man who collects samples of stuff from the various sources that the more appliances put in to aid the great task the more stuff there is to save. Now here is a great topic for discussion. Is this all as it should be? To some extent, yes. Then again, is it not possible that at times more goes away than is really necessary? Goes away at the source, I mean. One says to another, "Let it go, it is not lost. The save-all system will collect it." This is a wrong attitude, gentlemen. For the saving of the highest possible percentages of the stuff the work must go further back than the system itself. The study should be to limit the amount going away as much as possible, consistent, of course, with the necessity of not limiting production. Nothing good is ever accomplished without considerable thought, work and experimenting on the part of some. It must be a united endeavor on the part of all hands, both of those whose task it is to work where the stuff originally goes away, as well as those who attend to the save-all machines.

Wherever possible as regular amounts as the circumstances admit should be sent from the paper machines. I recognize the impossibility of always achieving this to perfection. But overloading a save-all machine at one time and sending a trifling soon after surely can often be avoided. When a save-all machine is overloaded the material going away from it is much greater than it should be and the result is, generally, that the save-all machine at the end of the system has too much going to it and the final waste going into the drain is too great.

There seems to be a general impression that everything that goes to the save-alls will be saved. However good a man or a machine may be, there is a limit to the capabilities.

Here are some questions the mill owner might ask himself and after he has found out all of them he will practically know just what his losses are in white water leaving the mill:

(1) Does each mill making book paper know the total loss in lbs. of fibre and filler every 24 hours?
(2) Does each mill know the individual losses from each paper machine, Save-all and Settling tanks?
(3) Have you experimented with mesh wire to use on machines and Save-alls to insure minimum loss of materials from this source?
(4) Does each mill know the actual dollars and cents value saved by apparatus for recovery of filler and fibre in white water and thereby determine the profit on the investment?
(5) Each mill should have a man whose sole duty is to give his entire attention to white water recovery apparatus, as the average employee does not understand the actual money value lost through this source.

We have all our machines equipped with Pneumatic Save-alls and the water coming from these Save-alls is used again on our Old Paper converting plant and also in our bleaching department for washing stock so that there is very little waste leaving our mill.

Here are some of the figures obtained from some of our Save-alls over a period of five days:

Pneumatic Save-all

Feed lbs.	Leaving lbs.	Retention per cent	Mesh
8.48	4.36	48.50	70
15.10	9.21	38.87	70
5.92	2.74	53.71	70
11.02	6.49	41.10	70
43.64	11.28	74.10	70

Old Style Save-all

Feed lbs.	Leaving lbs.	Retention per cent	Mesh
5.31	4.14	22.00	60
6.40	4.12	35.60	60
6.33	5.20	17.85	60
5.52	3.67	33.51	60
7.68	3.23	57.94	60

Dorr Save-alls all figures in lbs. per 1,000 gallons.

No. 1—3 Trays, 4 Compartments

Feed lbs.	Overflow lbs.	Underflow lbs.
45.30	0.60	94.55
7.50	1.03	22.33
9.89	0.23	26.83
22.35	0.58	77.25
11.08	0.41	25.18

No. 2—4 Trays, 5 Compartments

Feed lbs.	Overflow lbs.	Underflow lbs.	Gallons per 24 hr.
45.30	0.77	132.54	1,102,680

7.50	1.05	31.46	1,157,760
9.89	1.28	46.03	1,102,456
22.35	1.60	82.46	902,556
11.08	0.38	42.30	1,100,520

You will notice that the feed is alike on both tanks as the same pipe and pump feeds into both Save-alls.

With the Pneumatic and Old Style Save-alls, the retention generally increases as the feed to the machine increases as the pulp affords a fine filtering medium.

But by running the white water over these Pneumatic and then over the Dorr Save-alls we find they are the most efficient sedimentation system for the recovery of solids confined in so small a space for the amount of water to be handled from white water that has been tried at the P. H. Glatfelter plant.

Straw Board and Straw Paper Waste Water

By H. G. FUNSETT
Hagar Straw Board & Paper Co., Cedarville, O.

THE problem of waste water, wash water and white water in paper mills is a live question today. The salvage of fibre losses in this waste always has been a vital question but never to such a degree as at present. The high prices of pulp and the small margin of manufacturing costs makes this salvage vital. However, as important as this may seem the pressure that has finally set all mills to working on the question, is not the above, however vital in dollars and cents it might have been, but the pressure of outside agencies due to the damage to streams, fancied and actual, from dumping waste water into them.

The strawboard and strawpaper industry has worked on the disposal of waste water since the early days of the industry. The problem of the treatment of this waste water is still unsolved, but some progress has been made toward the simplification of the problem. The reason for the difficulties encountered can briefly be summed up as follows: The wash water from the beaters and washers contains a large amount of lime and about 30 per cent of the weight of the straw in solution with the water. This 30 per cent of the straw weight consists of the vegetable nonfibrous materials which are held in solution. This material cannot be collected by screens, neither can it be filtered through any kind of known material, untreated. Another difficulty has been the large amount of water to be treated. This has been known to be as high as 40,000 gallons of water per ton of finished paper. There are some methods of treatment that have been partially successful but have been impracticable due to the prohibitive cost of chemicals and the enormous size of the retention basins due to the large amount of water to be handled.

The most practical method for the disposal of this water, up to the present time, is that of storage, in large retention pools or basins covering many acres of ground. The water is disposed of through evaporation during the hot summer weather and some filtration through the ground. This method requires considerable land.

One method that mechanically works perfectly, if the chemicals involved could be perfected, is by means of a mechanism known as the Dorr Clarifier. Briefly, this outfit works as follows: A concrete tank, either round or square with rounded corners, is used with the bottom sloping from the outside towards the middle at a slant of about 30 degrees. The wash water flows to this tank after being treated with chemicals. The chemicals act as precipitating agents and because the water retained in the tanks remains perfectly quiet the vegetable solids contained in the wash water settle to the bottom of the tank. The clear effluent, if it were possible to make it such, flows over the skimmer into the stream or some basin prepared for it, to be used as may seem fit. The sludge, as it is called, or the precipitated vegetable matter, as it settles on the bottom of the tank, is scraped by very slowly-moving rakes from the sides to the center of the bottom of the tank. A sludge pump is connected by the required piping to this point and it pumps the sludge. The sludge then can be disposed of on filter beds where it can be dried and used as fertilizer or fuel. This method sounds ideal and if it worked as well as originally planned, the strawboard problem would be to a large extent solved. The trouble encountered, although the mechanical details work perfectly, is that we do not have the necessary chemicals that will precipitate these vegetable solids from the water as it leaves the mill. The chemicals giving the best results were ordinary milk of lime, made from lime containing about 80 per cent water-soluble calcium, iron sulphate and sulphate of aluminum. The proportions giving the best results were lime to the extent of 240 pounds per ton of finished paper, fifty pounds of iron sulphate per ton of paper or a similar amount of sulphate of aluminum. These chemicals were added to the wash water as it left the mill and the combination after a rather violent agitation for a minute's time flowed into the above mentioned Dorr tank.

The results accomplished in this Dorr Clarifier, although not satisfactory, were equal to the results obtained in test tubes and with laboratory methods.

Various other methods of treatment have been attempted but the methods described above have met with the most success. The most progress, however, in this problem has been not in the treatment of the water but in the change in methods of manufacture whereby it has been possible to decrease the amount of lime, used in the cooking, over 50 per cent; and because of this as well as other changes it has been possible to decrease the volume of water about 50 per cent. For instance, mills have used as high as 560 pounds of lime per ton of paper, whereas it has been demonstrated that it is possible to cook cereal straw consistently well with 280 pounds of lime per ton of paper. In reference to the volume of water handled it has been possible to decrease the volume of water from 40,000 gallons per ton of finished paper to 18,000 gallons per ton of finished paper. The decrease in the volume of water has been accomplished by the use of less lime and by a method whereby no water from the paper machine escapes to the sewer. All the water from the paper machine can be piped directly to the beaters and washers and used over again in the washing of the straw pulp. This water should not be held in tanks or chests but piped or pumped directly to the beater. The retention of this water will cause slime and consequent trouble. If the water goes direct to the beaters the results are satisfactory and this much of the problem, which does in fact correspond to the white water problem of the white mills, is solved.

It can readily be seen that considerable progress has been made and it seems that the eventual solution of the strawboard water problem lies in the further reduction in the amount of water needed. The above has been done using the same chemical re-agents for the disintegration of the cellulose in the cereal straws. No doubt if disintegrating chemicals which are soluble in water could be used in the cooking of the straw that the volume of water could be reduced considerably farther.

White Water Reports

By E. H. GILMAN and E. G. MILHAM
Bryant Paper Co., Kalamazoo, Mich.

THE paper manufactured by our concern is high grade M. F. book and coated raw stock containing from 8 per cent to 20 per cent ash. The white water we are called upon to handle averages about 10 pounds solid per 1,000 gallons water, of which about 7 pounds are clay.

Our aim in handling our white water is to recirculate all water not used on the paper machine to the conversion plant. However, before returning machine water to the conversion plant, it is our policy to install save-alls in order to recover as high a proportion of solids as possible from the water before it is used for washing old papers.

Types of Save-Alls Used

We have experimented with the high speed screening save-alls such as the North, and also sedimentation save-alls and low speed screening save-alls such as the Oliver and American. We have found that the high speed screening save-all is not well adapted to the type of water which we are called upon to handle. In the first place, its efficiency is very low with respect to the proportion of clay saved and, in the second place, it is very difficult to keep this type of save-all from filling up. Sedimentation save-alls have proven very satisfactory on our

type of stock. The main objections to this type of equipment are:

1. An extremely large settling volume is required.
2. A large time lapse takes place between orders on account of the volume of white water in storage in these settling tanks.
3. In cases where it is not possible to provide continuous withdrawal from the bottom of the sedimentation save-all, the efficiency being very high (95 to 98 per cent) and at other times being very low (70 per cent).
4. In case where stock hangs up inside sedimentation apparatus there is always a possibility of dirt and slime.
5. In order to work real well on book paper, it is essential that the sedimentation apparatus be thoroughly cleaned every week or two. This is a troublesome procedure, due to the great size of equipment.

Slow Speed Screening Save-Alls

The slow speed screening save-all, such as the Oliver filter or the American filter, is a comparatively new development in the paper making field. Its efficiency lies in the fact that long stock is added to the white water in order to make a highly efficient filter mat upon the wire facing of the filter. The average efficiency of this type of equipment, operation on our water which averages about ten pounds of solids per one thousand gallons, is about 90 per cent. The advantages of this type of filter are as follows:

1. It is comparatively easy in a book mill to provide the long stock which is mixed with the white water.
2. The efficiency of this type of filter is uniformly high and never erratic.
3. There is no time lag with this type of equipment.
4. There is no chance for stock to hang up and be decomposed.
5. The room required per one thousand gallons filtered is comparatively small (about 500 cubic feet).
6. This type of equipment can usually be located in the beater room or machine room, where it can be given adequate attention.
7. The filter apparatus is comparatively simple, requiring no labor and giving very little trouble to the operatives.

The disadvantage of this type of equipment, as compared with sedimentation apparatus, are:

1. Comparative high first cost.
2. The comparatively large amount of power required to drive the filter apparatus and its auxiliaries.
3. Occasional repairs to filter medium, pump, etc.

Remarks

While we have been operating American filters but a short time, our tests have indicated that this is a very efficient apparatus for taking care of the white water problem in book mills. We are still using sedimentation apparatus with good success in spite of its inherent disadvantages. We would not be bold enough at this time to state the ultimate type of equipment for handling white water in book mills, since at present the advantages and disadvantages of the sedimentation and filter type of apparatus about balance.

Report of Test Made

By A. F. ALLEN
Tidewater Paper Mills Co., Brooklyn, N. Y.

1. Period of test—one week.
2. There was 3,100 pounds less stock in our system at the end of the test than there was at the beginning. Therefore this amount has been included in the next item.
3. Pounds of bone-dry stock furnished during test—1,171,-113.91.
4. Pounds of bone-dry paper made during test—1,144,392.2.
5. Inclined screen type of save-alls used.
6. Quantity of white water to save-all during test—2,592,000 gallons.
7. Pounds of stock per thousand gallons of white water—15.5.
8. Pounds of stock per thousand gallons of save-all effluent —14.1.
9. Quantity of save-all effluent to sewer—1,800,000 gallons.

You will note from the above that our system is closed up very well and that we are losing on an average less than 3,000 gallons of water per ton of paper made. This, we feel, is an exceptionally low figure.

You will also notice from the above that the type of save-all we are using shows up very inefficient. For this reason we have practically decided to abandon the inclined screen type of save-all in favor of a more efficient type. We are considering either the Dorr or the American filter for this purpose.

We trust that this information will reach you in time to be included in your year book and that it is along the lines that you desire.

White Water

By JOSEPH D. SMALL and BENJAMIN T. LARRABEE
S. D. Warren Company, Cumberland Mills, Me.

WHITE WATER, a term used by paper and pulp makers to designate that portion which is extracted from pulp at different steps during the process of manufacture, is a source of considerable waste unless adequately controlled and closely watched by those responsible for its preservation. It carries varying amounts of fibrous material and clay or other loading substances as the case may be.

For every pound of paper weighed off at the dry end of a paper machine, 100 pounds of water is in the mixture at the screens, and of this 100 pounds approximately 80 to 85 pounds is extracted through the moving wire or taken out by suction devices, either the flat box or roll type or both. The fiber and clay content varies with different grades of paper and methods of handling, but it is of such importance and the whole assumes such vast proportions that pulp and paper manufacturers the country over are willing to spend large sums of money in order that this source of waste may be effectively cut to a minimum and a substantial saving made in the production of the various grades of paper.

There are several methods of utilizing the paper machine white water and probably all are more or less effective in cutting down the ever mounting wastes that are to be found in most mills. The time allotted to this paper would not be sufficient to describe all the devices employed on this very interesting problem, so the writer has selected one or two which may be of interest.

Some mills having sufficient room are installing large cement tanks in the basement under each machine and running the entire length of the wet end. These tanks take care of all the white water from the paper machine directly over head. At the same time the water flows into these tanks, then is added to it a little alum to facilitate settling.

A slowly moving scraper is sometimes run in the tank, from the inlet to the opposite or discharge end, where the settlings of fibre and clay are pumped to the beaters for thinning stock and for dumping purposes. The overflow from the discharge end is used for showers and a general supply on the paper machines.

It is necessary to clean these tanks at least once a week, when the mill is down, to prevent slime from accumulating and consequently spoiling a reel or more of paper. On starting up after a shutdown, fresh water is used until the system is full, when the fresh water is shut off and the equipment then acts as a closed unit, using the water over and over again until the week-end shut-down.

This method has proved very satisfactory and a great saving in clay and fiber, as well as a big cut in the amounts of fresh water, has resulted. It is practically automatic in operation, aside from the weekly cleaning, and maintenance costs are comparatively negligible.

Other mills employ the conical or inverted pyramid type of clay saver, having a capacity of from 10,000 to 20,000 gallons, connected to each machine, receiving white water from suction boxes, suction rolls and from pit and wire and first press. On some installations the suction box water, which is probably richer in clay and fiber content than from other sources, is pumped directly to the mixing or pump box, where it comes in contact with fresh paper stock from the machine chest. An amount sufficient to thin this stock down to the required consistency for screening is used; the remaining portion is pumped to the clay saver. This is not only a direct saving of paper making materials, but it also relieves the clay saver of handling a certain amount of water, and at

the same time cuts the use of fresh water at the mixing box by an equal amount.

When suction box water is not used as described above it usually is dropped to a pump box and from there pumped to the clay saver. The clay savers of the inverted pyramid type are usually made of cement, poured on the job. Usually two or three baffle plates or partitions are inserted, extending from near the top to within 3 or 4 feet of the bottom and equally spanned across. The clay water is pumped in at one side and agitation or side wash is retarded by these baffle plates, so that clay and fibrous particles settle rapidly and the overflow at the opposite side is practically colorless.

Water for the beaters for dumping purposes is drawn from the bottom of the clay savers. It is introduced into the beaters through the back-fall and in some instances replaces the fresh water supply in front of the beater roll. The overflow, containing a comparatively small quantity of clay and fibers, is piped to the sulphite mill.

Here it may be used to good advantage for thinning and washing purposes, from the concentrated stock in the bleaching system to the supply tank for the beaters. It has been suggested that brown or unbleached stock be washed from the blow pits with white water overflowing from the machine clay savers, but as there are so many subsequent operations before the pulp is ready for paper making, it is doubtful if much of the clay and short fibers would be retained.

It can be used to advantage, however, where the concentrated form of bleaching is employed, to thin this 16 per cent stock so that it can be pumped to drainers. This drainer stock may be flooded several times and allowed to drain, when it will be seen that there is quite an appreciable layer of clay and short fibers left on top, while the clear water has filtered through. Large volumes of water at a high pressure are necessary to force the heavy stock from the drainers, and white water is used when available. If it is necessary to run this stock over extractors, or filters, in order that the last traces of bleach or bleach residues may be thoroughly eliminated, it will be found that quantities of water are necessary to dilute the stock after dehydrating and washing, so that it may be in condition to pump to the paper mill.

It is easily seen from the above description that it is not so much a question of where to use the water as it is where to get it in sufficient quantity to satisfy every demand. By using water as described in either method, a large saving must be realized—a saving of materials as well as filtered water. It would be rather difficult to determine the exact saving to be made, manufacturing 100 tons of book paper a day, making the pulp to go into this paper, and conscientiously using every bit of clay water, but it has been demonstrated that the ash or clay content of pulp, where clay water has replaced fresh water insofar as possible, may run as high as 9 per cent and that an average of 6 per cent may be maintained at all times. This is only another way of saying that for every 96 pounds of stock produced in the digesters, 100 pounds is credited to the pulp mill, and a ready saving is realized in filler clay, furnished to the beaters.

In the manufacture of unbleached sulphite pulp practically all the white water can be reclaimed, and in most mills this is used in washing the pulp in the blow pits and at the head box for the screens. The fibers contained in the white water of bleached sulphite are usually reclaimed by the use of some type of save-all.

White Water Report—Newsprint

By C. K. ANDREWS
Itasca Paper Co., Grand Rapids, Minn.

IN ATTEMPTING to reduce white water stock losses at our mill, we have endeavored to arrive at the correct amount of water going from the mill, and the amount of stock being carried away with it. We installed a rectangular weir in our groundwood mill and also our paper mill. Gurley Level Recorders were used to measure the depth of the water going over the weirs. At present, the white water from the suction couches and presses does not go over a weir, but direct to the sewer, and the figures of stock losses in this water are based on the weight of paper before it reaches the couch and after it leaves the first press.

Following is a report by our technical department showing the amounts of stock lost in the various places throughout our paper and pulp mills, and also the methods used in calculating these amounts.

White Water at Paper Machine Suction Couch and Press Rolls

Density Bone Dry Per Cent

No. 1 suction couch	.047 per cent B. D.
No. 1 suction press	.035 per cent B. D.
No. 2 suction couch	.035 per cent B. D.
No. 2 suction press	.030 per cent B. D.

Volume which must be removed by couch and press rolls.

Production assumed to be 75 tons of paper.

Wet weight of sheet going to couch at 8 per cent dry	1,744,187 lbs.
Wet weight of sheet leaving suction press at 25 per cent dry	558,140 lbs.
Weight water removed by couches and suction presses	1,186,047 lbs.

1,186,047 lbs. white water at ave. 1.035 per cent density B. D. give a bone dry stock loss of 415 lbs.

Average weir reading on white water to sewer in groundwood mill, 70 gallons per minute for months of March and April, 1926, at ave. density of .096 per cent. This makes a stock loss of 806 lbs. B. D.

Average weir reading on white water to sewer in paper mill, 391 gallons per minute for months of March and April, 1926, at the ave. density of .041 per cent. This makes stock loss of 1,924 lbs. B. D.

SUMMARY: Daily stock loss in white water bone dry stock:

Paper machine suction couches and presses	415 lbs.
Paper mill excess white water	1,924 lbs.
Groundwood mill excess white water	806 lbs.
Daily total bone dry stock	3,145 lbs.

Mill Water Balance

Excess water in system in gallons per minute.

Paper machine excess—weir reading	391 G. P. M.
Groundwood mill excess—weir reading	70 G. P. M.
Water removed by suction couches and presses	99 G. P. M.
Water removed by straight presses and dryers	35 G. P. M.
Total water removed from systems	595 G. P. M.
Water added with wood in groundwood mill, (50 per cent B. D.)	10 G. P. M.
Water added with sulphite (39.6 per cent B. D.)	5 G. P. M.
Water added by leaks in grinder pockets and fresh water showers on paper machine wires and screens	580 G. P. M.
Total	595 G. P. M.

White water is re-used in the following places:

1. On grinders, and on all groundwood screens, including the bull screen, knotter, primaries, and flat tailing screen.
2. Filling all beaters including broke beater.
3. Trimbey stock regulators.
4. Flat screen on No. 2 paper machine showers.

Fresh water is used in the following places:

1. No. 1 paper machine screen showers.
2. Showers on wires of both machines.
   All white water passes over inclined screen type savealls before being re-used.

During the hot weather last summer, we had considerable trouble with slime, and it was necessary to introduce some fresh water into our groundwood stock, which increased the white water stock losses given in the above figures. Although we understand one of our neighboring mills are successfully using white water on the wire showers, we have not attempted to use white water showers on our wires, but have directed our efforts to holding the fresh water used on our paper machine wire showers to the minimum, as we do that introduced into the system at any other place in our groundwood and paper mill.

In the past we had difficulty in packing the cylinders of our

grinders, and considerable fresh water was introduced into the system at this point. By changing the cylinder heads and using a leather cup packing, we have eliminated the annoyance of frequently packing these cylinders, and made a material reduction in the amount of fresh water introduced into the system.

We have attempted to handle the white water from the different sources in such a way that the white water containing the lowest percentage of fibers will be wasted. At present we are using incline wire save-alls, but find the water, after passing over the save-alls, still contains too much fiber to allow to be wasted, and have investigated the Oliver Save-all. It seemed to us, in investigating this save-all, that it could be used as a decker with as low a percentage of fibers in the water removed as when operating as a save-all, and have arranged with the Oliver Continuous Filter Company to make a trial installation. If this machine is successful in deckering our groundwood stock with as low fiber loss as they anticipate, which is one-half pound per thousand gallons of water, we will use the white water from all other sources, and allow what white water we cannot use to be wasted from this machine.

White Water Waste

By B. T. McBAIN

Pulp and Paper Plant Problems

ONE of the greatest paper makers of all time, in the opinion of thousands in the industry, one John Lewthwaite, now deceased, familiarly known to the whole industry as "Uncle John Lewthwaite," always said regarding the wasting of white water:

"Water is the only conveyor that is thrown away."

If there could be found a better and cheaper conveyor than water for the handling of the various ingredients used in the making of a sheet of paper, that new form of conveyor would come into immediate and universal use. If that new method were chain or belt or other form of conveyor it would be used over and over again until worn out. Why not, then, use the water conveyor over and over again, for water is nothing more than the most economical and efficient conveyor known to the industry. The oftener it is filtered through the sheet the cleaner it should be.

I have investigated quite a few installations of so-called wasteless equipment. In one case on print paper only about 2½ per cent of the usual consumption of fresh water resulted and that plant today is practically a 100 per cent user of what heretofore was waste, but that mill buys its sulphite.

Many times I have had well known and high up in the industry people ask me what to do with the slime. One man said, for the first month, their reclaiming system worked perfectly, but then slime began to accumulate and they had to partially at least discontinue its use.

If a 100-ton plant, heretofore losing 8 per cent of its raw material, or say 8 tons per 24 hours 200 tons per month, saving $40.00 per ton or $8,000.00 per month, could not afford to put a good sized crew of men at work every Sunday cleaning out all the tanks and pipes to prevent the collection and breeding of slime, I can not figure, and I'm a Scotchman.

"Figures prove most anything," so one of the former presidents of a great Pacific Coast industry wisely said.

Take a 100-ton neswprint mill making 75 tons air dry ground wood and 25 tons air dry sulphite. They waste nothing. That is the ideal plant.

To make 75 tons of ground wood 3,750,000 gallons of water, in round figures, must be supplied to convey the pulp from grinders through pulp drains, knotter, screens and deckers.

To make 25 tons of sulphite some water must be wasted in the form of diluted cooked out waste liquor, acid-polluted steam condense, and through the blow pit bottoms when washing.

However, 1,250,000 gallons are needed to put this through the system and past the deckers.

One-half per cent stock equals about 50,000 gallons per ton.

Three per cent stock deckers equals about 8,000 gallons per ton.

Forty per cent moisture in wood, or 60 per cent dry and one cord used per ton of ground wood equals about 250 gallons or with two cords in sulphite per ton equals 500 gallons per ton.

It is apparent, therefore, that by returning all the white water from the ground wood deckers or about 42,000 gallons per ton there is still need for close to 8,000 gallons per ton of additional water.

In the case of the sulphite, the same condition applies, except that if the water from deckers and wet machines goes back to wash the pulp at the blow pits, an entirely new supply would be needed for conveying purposes.

With 8,000 gallons per ton of both sulphite and ground wood going to the mixers or beaters, it is necessary at the paper machine to start anew with 42,000 gallons per ton additional to bring it back to ½ per cent stock for 32 pounds 500's print.

With the sheet leaving the suction couch 15 per cent dry, there remains only about 1,500 gallons per ton in the paper.

If the showers are all equipped for the use of white water and the washup hose is not left running into the white water pit, all but 6,500 gallons per ton should go back to the screens to dilute the next ton of 3 per cent mixer stock to ½ per cent consistency and this quantity of 6,500 gallons per ton should go back into the showers after passing through the most efficient save-all possible to obtain.

There are showers at the screens, at the flow box, on the wire carrying rolls, at the guide roll and at the save-all under the couch. If white water is used at all these points some new water should be needed to compensate for that going to and being removed by the presses and dryers.

When the paper goes to the reel with 8 per cent moisture or about 160 pounds, there remains about 20 gallons of water or thereabouts per ton.

As I see it, there should be nothing wasted at the ground wood mill, in fact, some fresh water added.

There should be none wasted at the sulphite mill and all water going to sewer being that from the washing and spent liquor at blow pits.

There should be no waste from the paper mill, the only water going to waste being that from the washup of felts and floors.

I'm willing to be shown if my figures are wrong. I have, however, operated both ground wood and paper mills without any waste whatever, and others can do likewise.

With such a closed system mechanical save-alls should not be necessary, but to prevent error and possible loss on account of inattention on the part of operatives as well as to prevent showers plugging, I am favorable to the use of the best possible equipment obtainable. It is not the purpose of this article to advertise, but there are now available save-all machines guaranteed 90 per cent to 95 per cent efficient on this grade of stock.

This same condition applies to wrappings and I can not see why it should not apply to book, bond and everything else except possibly where the sulphite and stocks used have to be bleached. However, I can not see why the wash water from the bleach system should not be used for washing at the blow pit and the fiber remaining in the bleach water caught at that point.

This is simple. Just cut off the fresh water at all points and put all the water pumps on the screened return water at some one or more central tanks. Of course, some fresh water is needed. This can be arranged for with float valves in these tanks.

The next mill I build will have screened return water connected with the washup hose so if it is left runnig into the white water pit the water will simply circulate.

Figure it in gallons or pounds and it goes the same, or else figures lie.

Figure on Dorr Save-All Operation

At the Peerless Division of the Mead Pulp and Paper Co.

THE white water is handled by two Dorr save-alls, one to each machine. The volume of each save-all is 15,000 gallons. The feed to the save-alls consists of the white water from the wire pit, white water from the machine save-alls, through which the couch pit water is passed, and excess tray water.

The amount of water fed to the two Dorrs is 750,000 gallons or 375,000 gallons to each Dorr. At the present time feed runs about 23.0 pounds of bone dry stock per 1,000 gallons. The

clarified water from the Dorr runs about 1.64 pounds of stock per 1,000 gallons. This stock consists of 20 per cent fiber and 80 per cent filler.

The recovered stock or Dorr slush runs 108 pounds per 1,000 gallons. The total amount recovered is 15,800 pounds in 24 hours. The clarified water is used for sprays, showers and Jordan head box.

In order to obtain the best operating condition it is necessary to draw the slush from the botom of the Dorr continuously. Unless the slush is withdrawn continuously, the Dorr may be filled with the slush and the clarified water will be enriched with the result that sprays and showers will be clogged and damage may result to the Fourdrinier wire because of stock lumps.

The slush from the Dorr is drawn into tanks continuously. From these tanks the stock is pumped to the beater room as needed. The Dorr slush is used exclusively in furnishing the beater, no fresh water being used. The slush consists of 30 per cent fiber and 70 per cent filler.

With our operation the Dorr save-all works very well. The recovered stock is all used in furnishing beaters and the showers and sprays use all the clarified water. As we are making only white paper we do not have the problem of colors to contend with. We have no figures for comparison of different operating conditions for our operation remains practically constant, as we are running one weight of book paper continually.

Calculation of Dorr Flow

Beater furnish—81,000 lbs. of bone dry material.
Beater consistency—6.25 per cent B. D.

$$\text{Weight of stock} = \frac{81{,}000}{.0625} = 1{,}295{,}000 \text{ lbs.}$$

Weight of water = (1,295,000—81,000) = 1,214,000 lbs.

$$\text{Volume of water} = \frac{1{,}214{,}000}{8.35} = 146{,}000 \text{ gals. furnished to beaters.}$$

Dorr slush runs 108 lbs. per 1,000 gallons.
Door feed runs 23.0 lbs. per 1,000 gallons.
Dorr overflow runs 1.63.

$$\text{Volume of feed} = \frac{146{,}000 \times 108}{23.0 - 1{,}630} = 740{,}000 \text{ gallons.}$$

Weight of Dorr stock recovered = 146 x 108 = 15,800 lbs.

$$\text{Weight of Dorr stock per beater} = \frac{15{,}800}{64} = 247 \text{ lbs.}$$

Machine Waste Water

By STEPHEN W. SMITH

Bird & Son, Inc., East Walpole, Mass.

THE waste water from paper machines is treated by chemical precipitation with a solution of alum requiring about 5 grains per gallon to effect a satisfactory effluent. This effluent is discharged directly into the river. The sludge from this treatment is pumped back into the Shartle system of beaters and is used for dilution purposes in place of fresh water.

Twelve tanks with conical bottoms are provided for the treatment of approximately 4,000,000 gallons per day. The average capacity of each tank is 103,000 gallons. About 25 per cent of each tank is reserved for sludge storage. Alum solution is added near the intake to centrifugal pumps pumping waste to the tanks and is consequently well mixed with the white water to be treated.

Tanks are operated on the fill and draw plan and are used in rotation.

A system of this type purifies the waste to about an extent of over 96 per cent of total suspended solids.

Regular Boiler Waste

We know of no treatment suitable for this liquor. The only way in which to eliminate this water from their mill waste water is to have it drawn off into a tank wagon and disposed of on some dump.

Washer Wastes from Washing Engines

Should be treated on graded sand filter beds of sufficient area to allow for beds to dry out so they will not become sour. Beds should be properly cleaned and rooted as often as necessary.

White Water Questionnaire

1. What type or make of save-all is found to be most efficient?
2. Can white water be satisfactorily used on showers for cylinders and rotary screens?
3. What effect is experienced with white water on slime formation? How much does it tend to increase?
4. If white water is settled or coagulated with alum what is done with the so-termed "sludge" formed?
5. Does the use of white water in the beaters affect the wetness of the stock? If so, roughly how much?
6. What effect does white water have on sizing if used in lining engines?
7. To what extent does white water tend to increase foaming?
8. What is the best type of shower to use if using white water?
9. What effect is experienced on the felts on the board machine filling up where white water is used in the stock or so-termed "sludge" is used in the beaters?
10. How does the use of alum in a beating system reduce the amount of suspended matter in white water?
11. In using alum for settling white water, which system has been found the most efficient? Alum in solution or in the dry state?

Chemical Equipment Manufacturers National Show

An exposition which in several of its features, it is asserted, has added a unique chapter to general trade exposition history, occurred in the Cleveland, Ohio, Public Auditorium May 10th-15th, inclusive, under the descriptive title of the Chemical Equipment and Process Engineering Exposition.

It was promoted and managed by the Association of Chemical Equipment manufacturers, a national trade association of companies not, as its name might imply, manufacturers of laboratory apparatus, but of a wide range of both standard and specialized machinery, equipment, materials and accessories essential to the operating stages of the long list of industries which at one or more steps in each have a process phase.

The outstanding feature and, according to the Association of Chemical Equipment Manufacturers, the one which is unquestionably unique in the history of American trade and technical expositions, was the co-sponsorship of the exposition, together with the association, by a group of technical organizations embracing in the variety of their professional interests practically the entire range of modern engineering and industrial technical science.

In addition to the Cleveland Engineering Society with some 800 professional members, sections, chapters or membership groups of the American Chemical Society, Carnegie Institute of Technology Alumni, American Electrochemical Society, American Welding Society, Society of Industrial Engineers, American Association of Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Civil Engineers, American Society of Heating & Ventilating Engineers, American Society of Mechanical Engineers and American Society for Steel Treating, participated in the schedule of events of which the exposition was the center.

A co-relative feature of the exposition, in its significance, only slightly less unique, according to the association, was the range of industrial activity represented by the registered attendance. The general public was excluded throughout the exposition, only technical and industrial men being admitted upon identification. More than 2,000 of the latter registered. Registrants came from 28 states, Sweden, Hungary, Germany and Canada. Advanced technical students from 38 colleges were also admitted.

Displays of machinery, materials, equipment, etc., in the exposition were classified as to utility possibilities in each of these major divisions of the process industries. Sessions, dinner and luncheons of the various technical organizations cooperating with the association occurred throughout the week.

It is reported that the United States Gypsum Co., Chicago, Ill., is to build a new paper mill at Kansas City, Mo.

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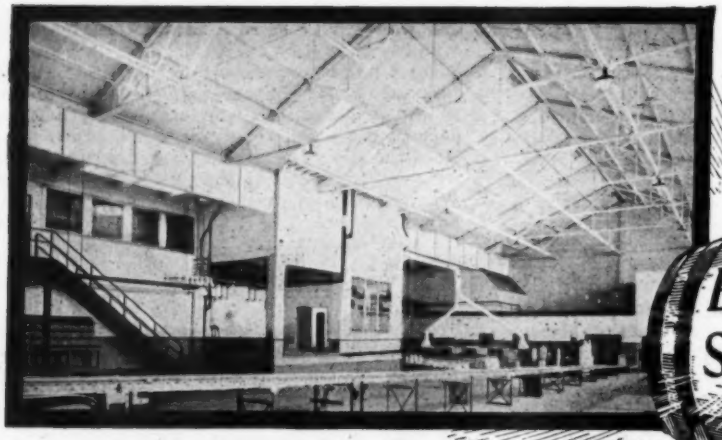

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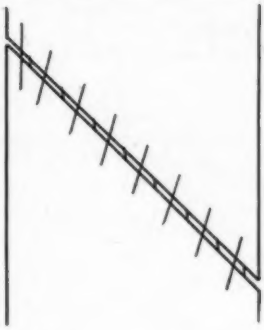
Practical Helps for the Mill Man

Diagonal Belt Join

BELT manufacturers are recommending to their clients that they try the English system of lacing a belt—on the diagonal principle as shown in the sketch. This can easily be done with wire lacing and is possible with malleable hooks. It is not difficult to conceive of adapting the flat link type of belt fastener to this kind of splice as well. It is felt that among other advantages this system of lacing relieves the shock to the whole belt as the joint hits the pulleys.



Lime Consumption

A STRAWBOARD mill superintendent gave some interesting figures on the relative advantages of magnesia lime and calcium lime. For various reasons he had been using lime with a high magnesia content. The consumption of lime per ton of strawboard had been 240 pounds. On a change to lime with a high calcium content, he reduced the consumption to 178 pounds of lime per ton of pulp. There was an additional advantage in the use of the high calcium content lime in that it slacked much more easily.

Saving Dryer Felts

THERE is great danger of damage to the dryer felts on fast speed machines by wrinkling when paper goes up on the top dryer felt around the dryer felt rolls. Where the speed is pretty high, the paper often goes up like a flash and is most difficult to stop short of breaking the paper at the wet end and shutting down the dryers. Put a compressed air shower beside the first return roll and turn it on whenever the paper is taken over the machine, and at once on a break behind the calenders. This compressed air shower will drive the paper back and down and prevent it from following the dryer felt.

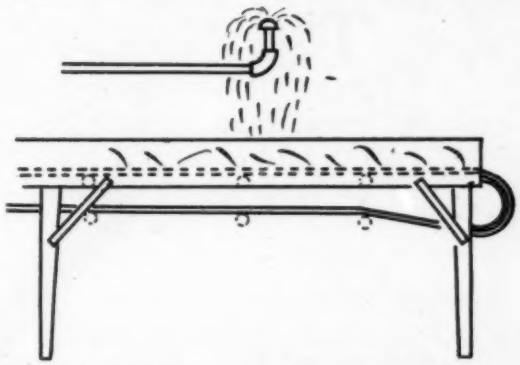
Killing Foam

SOME interesting points about killing foam were brought out at a sectional meeting of the American Pulp and Paper Superintendents' Association. The discussion turned on the killing of foam by chemical means. It was urged that kerosene (coal oil) be avoided. This was on the ground that it was a solvent of the size in the furnish and would produce gumming on the press rolls further on in the machine. Vegetable and mineral oils of various kinds were suggested. One was a red oil produced by a firm of soap manufacturers said to be employed by yeast manufacturers to kill foam in their tanks. Another was a mineral oil of which the name was not given, but which had been recommended by Standard Oil engineers who had been called in to help solve the problem. Distilled vegetable tallow was another oil recommended. It was pointed out that where 4 or 5 quarts of kerosene were used to kill foam a pint or even a half pint of vegetable or mineral oil would do the same work.

One Cause of Foam.—In connection with the foam problem it was pointed out that screens were frequently set too high and the pipes connecting the screens and the vats were much too small. This arrangement produces a great deal of agitation, which is in turn the cause of foaming in a good many cases.

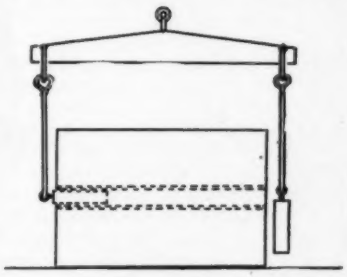
Spray for Sorting Paper

INSPECTION of old papers in mills which use only sulphite papers and never groundwood papers is very important. The sprinkling of the testing acid is sometimes very laxly done when the acid is carried in a can and sprinkled by one of the workers at the sorting conveyor. To insure the thorough sprinkling of the papers passing on the conveyor, a simple gravity system from an overhead tank may be arranged. One of two sprinkler heads may be placed at the beginning of the conveyor and the old papers will be thoroughly sprinkled before they come to the sorters who are to take out the groundwood papers.



Handling Rolls

A SIMPLE but effective substitute for a whole shaft to run through a roll is shown in the illustration. This is for use where the rolls are carried from one part of the mill to another by monorail conveyor or crane. About a foot of shafting is attached to each cable of the roll lifting bar. These are inserted in the core when it is desired to move the roll. This is much quicker than having to handle a heavy piece of shafting in and out of the core.



Small Deckle Straps

MUCH thought is being given these days to deckle straps—how to get along without any and whether that is the best solution of the problem. One mill has solved the question to its own satisfaction by using very short and very narrow straps. They confine the stock to the forming part of the wire and stop when the sheet is capable of running by itself. The objection to the type of device designed to do away with the deckle strap is that the edge of the sheet frequently is so bad that much of it must be trimmed off, thus filling the white water system to a disadvantageous degree. This will cause many to think well of small, light deckle straps.

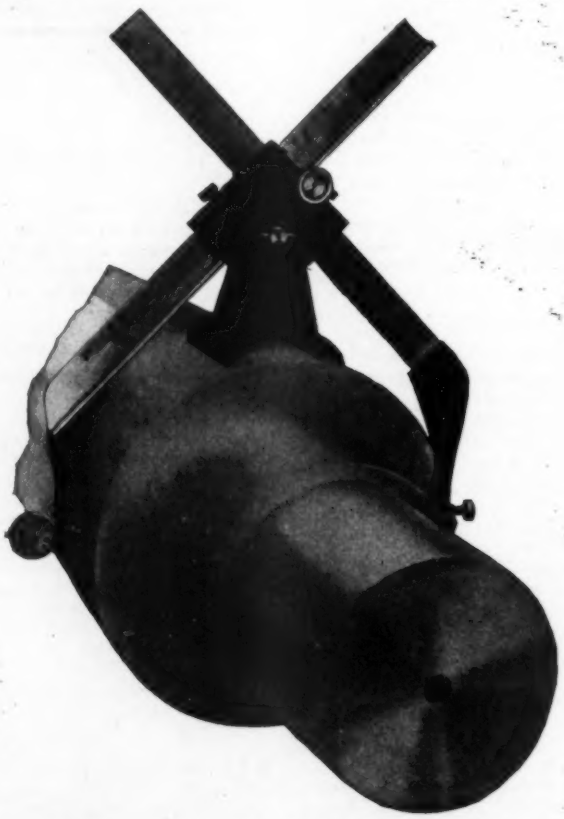
Taking Out Static

A BACKTENDER prefers and uses a piece of light chain to take the static out of the sheet at the calenders. He says that the chain is less springy than wire and at the same time heavier. On a break, the chain immediately drops carried by its weight. Wire frequently retains a good deal of spring and jumps into the calenders as the paper leaves it.

LOBDELL

Improved Micrometer Roll Caliper

THIS handy and accurate instrument is indispensable in the mill that is equipped to regrind its own rolls and will be found equally useful in every paper mill in keeping an accurate check on the condition of the calender and press rolls.



USED in connection with the Lobdell Roll Grinding Machine, illustrated and described on page 371 of the 1925 Pulp & Paper Mill Catalog or in our Booklet on the Grinding & Care of Paper Mill Rolls which is yours for the asking, your rolls can be kept in perfect condition with the least time and expense.

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Wilmington, Delaware

Established 1836

Conversion Costs as Effected by Lubrication[1]

By THOMAS E. DIAL
Vacuum Oil Company, New York

THERE is probably no industry today which requires of the superintendent such a wide range of knowledge as that found in the manufacture of paper. He must have a definite knowledge of raw materials, their preliminary preparation and conversion into pulp. He must know the art of handling these pulps through the various machines in order to produce a commercial product, acceptable to the trade and salable at a reasonable profit.

In these days of keen domestic and foreign competition, high cost of raw materials and labor, and finally high power costs it is doubly important that the superintendent have authentic information regarding every factor affecting his cost of production.

Wider Vision

There has been a general awakening in the industry as a whole, and much has been done and progress made toward meeting this condition of keen competition.

In the newer mills the problem has been simplified inasmuch as they have had the advantage of newer and more efficient types of machines. The electrical drive with its low power losses has supplanted the older types of belt and rope drives. The steam turbine-driven electrical generator has enabled the mill using large quantities of electrical energy to seriously compete with the hydroelectric plant. This is especially so where newer types of boiler equipment have been adopted and where pulverized coal has supplanted the older and less efficient types of hand and stoker fired furnaces.

A close inspection of the newer designs shows the latest paper machines equipped wherever possible with ball bearings. The old types of plain and ring bearings for line shafting and back drive stands are being discarded in favor of ball and roller bearings; in fact the tendency seems to be to adopt every device offered consistent with good design, that in any way will influence a saving of power.

Power and Maintenance Cost Important Factors

The cost of production may be divided into (1) the cost of raw materials, and (2) the cost of conversion. The cost of raw materials varies in different mills, and there are other factors, such as freight, full time operation, etc., which more or less balance any advantage that one domestic mill may have over another.

When, however, we analyze the second item, the cost of conversion, we find in many cases an extremely wide divergence, depending almost entirely upon the efficiency of the mechanical equipment, of which power generation is perhaps the principal item and variable.

From our observations in which I believe you will concur, we have been led to conclude that the present process of making paper requires more power per ton of product than almost any other industry. With this in mind and if we consider such items as cost of raw material, the technique of processing as being equal, the competition of one mill with another is one of power costs.

Naturally it follows that the most successful organization is one which has the lowest cost for power, and uses the least power per unit of output.

Of the many things entering into the cost of conversion, such items as power cost, repair, material and labor are capable of betterment from a mechanical viewpoint. If we can reduce the maintenance cost, which includes repair, material and labor costs, we have helped our condition of conversion cost. But if we can reduce the power cost even by a small percentage we will have made a decided reduction in our conversion cost, since this item in most mills is by far the largest. As a typical example let us consider the following case taken from the actual records of a large mill and which I believe will serve as an average of its class:

[1] Read before the American Pulp and Paper Mill Superintendents' Association at Detroit, June 4, 1926.

Percent Cost of Conversion	
Repair labor	5.70
Repair materials	3.62
	9.32
Steam and electrical power	47.00

In view of the above high cost of power which is 47 per cent of the total cost of conversion, it follows that it is well worth the time and effort that most managers and superintendents are giving to this subject at the present time.

Correct Lubrication an Important Factor in Power Saving

The question of most importance to you is, "What can we do toward lowering these two costs?"

(a) The cost of maintenance.

(b) The cost of power, which so vitally affects the conversion cost and finally the cost of production.

Here I might say is where the specialist in lubrication finds the most fertile field in the paper industry. It is readily agreed that without some sort of lubricant it would be impossible to operate your machinery for any considerable length of time. Just as lubrication appears as an important factor in machinery operation, so the kind of lubrication looms up as a puzzling and often a trying problem.

We find in the lubrication of machinery as many degrees of value of lubrication as there are oils offered for this work. There is here, like everything in life, one correct method, and because of this we choose to use the term "Correct Lubrication."

By correct lubrication of a paper mill we mean the right oil in the right place in the right way.

This definition, which I believe you will agree is acceptable, requires a deeper study of mechanical conditions, and is more far-reaching than just oil and grease.

The problem of correct lubrication of a paper mill is an engineering one, requiring careful study of the various types of paper mill machinery and their operating characteristics. In addition to this mechanical study is the technical study and tests of all types of crude oils and their method of manufacture into lubricating oils, before an oil can be recommended to perform the service required.

As an example of a lack of this method of study, take the case so often found in mills where a medium bodied, low priced and low grade oil is chosen for general plant lubrication. This product which gives more or less satisfaction when used in plain bearings of line shafting is also often used for the lubrication of wet bearings such as are found on wet machines, presses, and table rolls of Fourdriniers. Under these conditions of operation, the water soon washes this straight petroleum off the bearing surfaces, and the journals become raw and scored. This lack of correct lubrication, and raw and scored bearings soon increase the power required to operate the rolls and in time builds up your maintenance cost.

If, on the other hand, a little time and thought were used in giving this problem the consideration it deserves there would be used the correct grade of the right compounded oil such as would retain an oil film in the presence of water, with a resultant saving in power and maintenance costs.

There is no machine in the entire mill more important than the beater, yet how often do we find bearings which have been packed with grease months ago, and a little added from time to time. If these are examined you will find that the grease has from the heat of friction long ago given up its oil of lubrication and cooked to a crust of carbon. This carbon with some stock and water that has flowed into the bearing has so grooved the journal that in many cases it resembles a threaded bolt. This wearing of grooves has cost you little for lubrication but a great deal in terms of loss of power and high maintenance costs.

If you realized that such lubrication was adding to your conversion cost at the rate of four horsepower per bearing you could reduce your losses to a monetary value quite out of proportion to the cost of correctly lubricating such bearings.

At the rate of a loss of four horsepower per bearing, or a loss of eight horsepower to each beater, at an average cost of $50 per horsepower per year you find that your lubrication cost of $200 per year for a single beater is all out of proportion. Then if you figure the maintenance cost in labor and materials to replace this scored journal with one smooth and

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It is an established fact that the smooth operation of the sizing process is necessary to trouble-free production. So Kalbfleisch Engineers are glad to place at your disposal all the information they have acquired from their long and close acquaintance with sizing processes.

The service of Kalbfleisch Engineers is centered upon securing your satisfaction by means of the De Cew Patented Processes with which Kalbfleisch Rosin Size is used.

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in first class mechanical shape to operate, you could perhaps add another $200 to the cost for incorrectly lubricating this machine.

If we throw the same searchlight of careful analysis on other and perhaps more important machines, such as paper machines, machine calenders and supercalenders, we begin to understand that the thing we call lubrication is a most important factor bearing on your operation and eats as a microbe into the very vitals of your cost of production.

Most mills today are awakening to the fact that after all, all oil is not oil and there are varying degrees of lubrication. There is, however, a big field of improvement ahead of most of us in the lubrication of our machinery.

Another of our problems is the lubrication of the dryer roll journals. Here I have found any oil used from ordinary black oil to the heavy cylinder stock, and no consideration given to the type of bearing and its method of oil application. We have the collar oiled bearings, with and without spreader, and the one and two ringed bearings, and on the older types of machines a plain bearing, either grease lubricated or in some cases oil lubricated, but in most cases I have found no real attempt made to adopt the oil correct for the characteristics of the bearing and method of application.

The steam joint, a necessary evil, has been lubricated after a fashion, but in most cases investigation has revealed no serious attempt to correctly lubricate this important bearing. If we fully realized that this bearing, while small and tucked away out of sight, is a power consumer we would bring it out into the light of investigation and save in many cases as much as 10 horsepower per machine. I have in mind one mill that, after investigation, decided to spend over $400 in the purchase of force feed lubricators to make sure that each joint was receiving its proper amount of the correct oil, and they regarded this expenditure as a paying investment.

The dryer roll journal like the steam joint is perhaps the most difficult bearing to lubricate and especially is this so in the newer and high speed machines.

In some mills where we have run exhaustive tests both on oil *versus* oil and oil *versus* grease we have found a serious waste of power where the right oils were not used. In one mill electrically driven and where all variables were carefully checked and the watt meter read half-hourly, a test of oil versus oil, over a period of twenty-six days, the machine producing varying weights of paper ranging from 33 to 66 pounds, a 10.2 per cent saving in horsepower was noted on one oil over another.

There are many reasons why one oil was better for this condition than the other; the principal reason was that the correct oil was made especially to meet the operating characteristics of these bearings.

Some time ago we made horsepower tests on paper machines in two board mills. In these mills the machines were grease-lubricated. In one, a saving of 27 per cent of power was noted and in the other 34 per cent. In each case this saving is the saving in power taken when the machine was shut down on a Sunday morning and just after the tour was completed, and machine running light. In other words, there was no paper passing over the machine, and the figures represent a frictional power saving.

These figures may seem astounding, but from my observations there are many mills today in the same class and some even worse.

While power is an important factor in the manufacture of paper, yet it is not the only one affected by lubrication.

In no other industry as in paper making is speed so important. By speed I do not mean simply the speed of the paper machine alone but rather the synchronizing of speeds of the various machinery having to do with the forming, drying and finishing of the sheet. The whole system may be in tune at one period and may vary from this condition to a slowing up or slippage of a press which ends in broke, or loss of production. Some time ago I inspected a set of dryers where the lubrication from grease on the front side was so poor and the journals so raw from metallic friction that the dryers were vibrating in their bearings. As a result a wrinkled paper and material loss of production. After the grease was removed and the correct oil applied the vibration stopped and a better sheet with a higher production per machine hour of operation resulted.

Therefore, we see that lubrication affects speed perhaps only slightly yet sufficient to throw the system out of time and while this variation in speed is only momentary in many cases yet it is the source of so many unaccountable "breaks."

Speed varies either because of poor lubrication or a lack of lubrication. If this is not corrected bearings become heated, expanding the journals and rolls, causing poor formation through presses, and especially is this noticed in machine calenders.

There is perhaps not a superintendent who has not at some time or other experienced the effect of the expansion of calender rolls, which invariably results in soft nose rolls.

The lubrication of the machine calender is not a difficult problem if an oil of correct body be used, yet the efficient operation of any stock is dependent upon a uniform supply of oil at all times and here as in most machines of this industry the correct application is as important as the oil used.

No bearing can work efficiently without a uniform rate of feed of oil. The bearing that is hand oiled has more oil than is required for correct lubrication at the moment it is applied, but a few minutes later this drains away and it is not long before the bearing is starved and from this point until oil is again applied heat is rapidly generated indicating undue friction and waste of power. Because of this condition of increased temperature and power loss, we strongly recommend a uniform application of oil to the machine calender.

In some instances the mechanical force feed lubricator is recommended. In other cases the wick feed system, and on large stacks always a circulation system on the bottom roll.

The top and bottom bearings are pressure carrying and often this pressure builds up to a very high unit value, often beyond the point for which they are designed, and unless they are protected by some sort of mechanical device for feeding oil uniformly the bearing metal may be heated beyond its melting point nad result either in a run or wiping of the metal, or become badly scored.

Here as on the paper machine or presses a very material saving in power can be made by using an oil which has been manufactured to meet the extreme operating variables such as speed, pressure, radiated heat and in some cases water, if bearings are water cooled and sweating is present.

The machinery builder is making rapid strides in bearing design He has called in the best mechanical engineering talent and having gained through this the best that mechanical science offers, he again reaches out and has called into conference the oil manufacturer and lubrication engineer that he may make sure his bearings are designed to give maximum service at minimum cost for power.

The day of the ring-oiled dryer roll is fast passing and the day is not far distant when all new dryer bearings will be equipped with a full circulation system. In fact the writer has not long since had the pleasure of lending engineering assistance to a manufacturer who is building large and fast news machines and has adopted as standard the circulation system on dryer bearings.

If you will inspect some of the newer types of supercalenders, you may be surprised to note that these are being sent to the user fully equipped with the circulation system for oil and further, the builder has been so concerned with how his machines shall be lubricated and knowing the importance and value of the correct oil, he has attached a metal plate giving the brand name of the oil to use.

This is done not in the nature of oil advertising but of necessity; for any oil will not suffice if maximum production is to be obtained at minimum cost.

It is well to heed the machinery builder's oil recommendation for the machinery you are operating and thus profit by his research effort. As an example of what can be accomplished in power saving on supercalenders, let us look at the following test on two supers electrically operated.

	Power used in operating on unsuitable oil	With correct oil	Saving
Stack 1	73 H. P.	58.22 H. P.	14.78 H. P.
Stack 2	97.8 H. P.	79.2 H. P.	18.6 H. P.

THE JOHNSON FRICTION CLUTCH

as used on the

D. & D. Safety, Paper-Tag, Making Machine

Single clutch with pulley mounted

"Just Answers the Purpose"

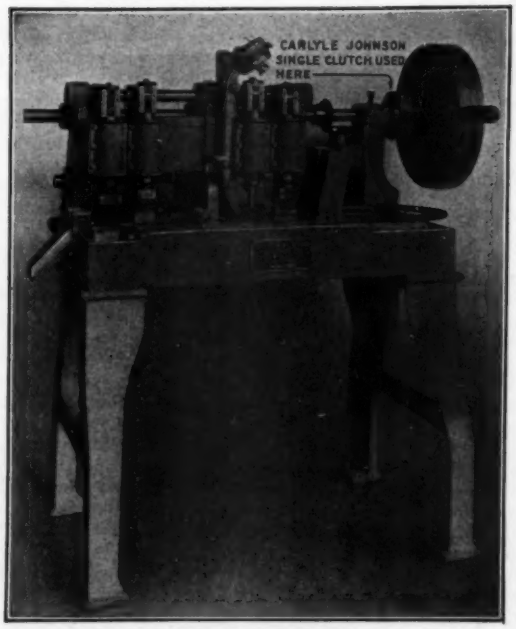
—says the Builder.

. . . "The Johnson Clutch just answers the purpose, as it stops the machine instantly when required, **and no counter-shaft is necessary.**"

—D. & D. Machine and Tool Co., Inc.

A Johnson Single Clutch on this machine gives perfect control. Saves expensive countershaft, just as the builder says. Easily installed, easily lubricated, smooth in operation. It is a powerful, compact, long-life clutch. Many installed twenty-two years ago are still going strong. Splendid for paper machines of all kinds.

Write today for catalog "P. I."



Courtesy The D. & D. Machine and Tool Co., Inc., Elizabeth, N. J.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

A careful check was made of all variables and watt meter read at hourly intervals. The test was made in each case over a period of two weeks. In this mill the electrical energy cost was an average of $50 per H. P. per year.

On Stack 1, $739 was saved in one year for power while on Stack 2, $930 was saved, or a total of $1,669 was saved by merely changing from the use of one oil to another.

I have been in some mills which operate as high as twenty-two supercalenders. Consider for a moment what a saving of $500 per year on each machine would mean to this concern—something over $10,000, a value which if spent in oil correctly applied would lubricate the entire mill for a year.

We see from this comparison that the term "oil cost," though it holds a certain attraction for the accounting department or purchasing agent, holds no terrors for the superintendent in terms of horsepower saved.

Let us dwell for a moment on oil cost, either oil cost per ton or oil cost per gallon.

In the mill cited above where the power cost, both steam and electrical, is 47 per cent of the cost of conversion the oil cost is 34/100 of 1 per cent. In many mills of which I have record it is even less than this figure. With a cost as low as this why spend sleepless nights worrying about a few cents more or less per ton when you might save dollars by a careful choice of oils designed to meet your operating characteristics.

From data I have collected in the course of more than ten years' experience in the lubrication of paper mill machinery in all types of mills, I estimate that any mill can save at least 5 per cent of the total horsepower required to operate its machinery by a careful analysis of conditions, choosing and correctly applying the correct oil.

I have mentioned oil cost with a great deal of temerity, for unfortunately the yardstick by which many managers and sometimes superintendents and most purchasing agents measure lubrication is in terms of oil cost. In some mills a cost of 10 cents a ton would be minimum for the arrangement and types of machinery used. In another the minimum might be 15 or even 20 cents a ton. Hence it is unwise to boast of your oil cost until you have had a careful analysis made by men who specialize in this work.

You will agree that no one man can know everything; this is the age of specialization and if you are to obtain the best in anything go to the man who does nothing else but specialize in the manufacture of that article. It goes without argument, that if a felt manufacturer is to make felts he cannot be an expert in this and at the same time make wires, steam engines, and oil. The superintendent today is specializing in the manufacture of paper; he is thinking in terms of production and has not the time to try every oil on the market. His time is too valuable; therefore, the question naturally arises, "How am I to determine the best oil for my machinery?"

How to Determine the Value of an Oil

The value of an oil for the lubrication of machinery, that is, the price per gallon or the price per ton that you can afford to pay, depends upon the following:

—How much power does it save?
2—How much is this savable power worth?
3—How much wear does the oil prevent?
4—How much do preventable repairs cost?
5—How much, beside the cost of repair, is lost by preventable wear?

These questions are vital to correct lubrication. Correct lubrication can be secured only by one who knows all types of machinery; the lubricating characteristics of all crudes, the best methods of their distillation, filtering and blending of manufactured oils, and finally the finished oil suitable to meet the operating characteristics of the machine in question.

In conclusion I wish to call your attention to what can be expected through correct lubrication.

1—Maximum power.
2—Economy of fuel.
3—Minimum maintenance cost.
4—Minimum loss of time.
5—Minimum depreciation.
6—Minimum fire and personal hazard.
7—Minimum oil cost.

I have not in a paper of this length tried to cover the details of correct lubrication of each machine used in the paper industry but will feel well content if I have interested you to a sufficient degree in this important subject to warrant your further and more complete study.

A Popular Machine Drive

Today paper makers are more concerned about their prime movers than ever before in papermaking history. No doubt this is due to the many improvements that are constantly being perfected and brought to the manufacturer's attention,

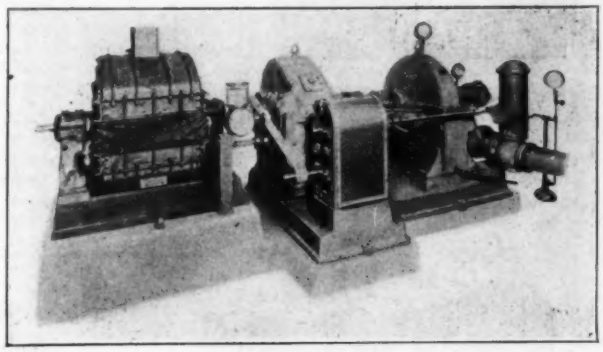


Figure 1

as well as the fact that power-cost figures a big percentage of the production dollar and keen competition forces him to seriously consider every means of saving presented from this source.

Among the many types of power generators used in paper

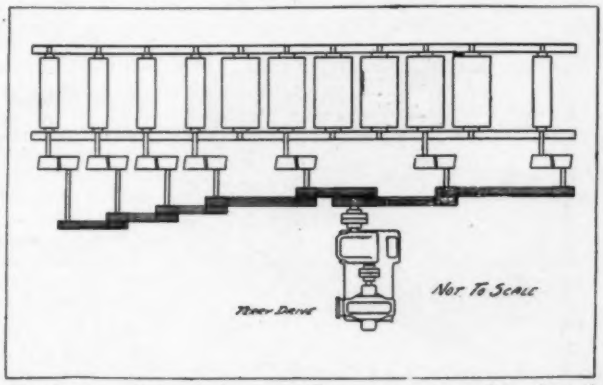


Fig. 2—Rope Drive System with Terry unit connected to the tail shaft

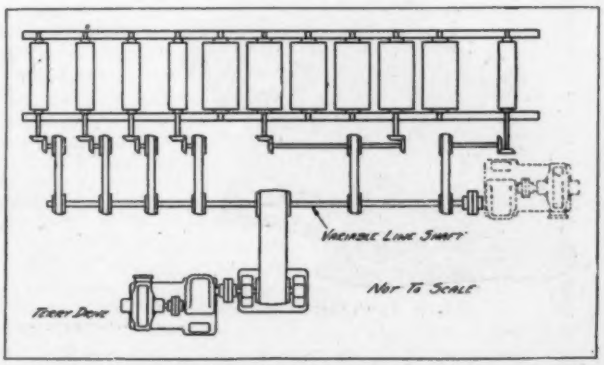


Fig. 3—Marshall system with Terry belted or direct connected

mills, the steam turbine is enjoying its share of popularity. The Terry Steam Turbine Co. reports that they have furnished six times as many paper machine drive units to paper mills

ALL ACES

Heavy Type 4-Drum Winder

A Device for Removing Wrinkles Instantly

"Moore & White" Winders make smooth, even sheet. They waste little paper.

Six hundred Winders in operation on all grades of paper. "Some" Winder, you say. It is indeed a wonderful Winder. One Mill alone thinks so well of them they ordered up-to-date something like fifty. Good, hard rolls without wrinkles. The only wrinkles around the Mill will be those on the winder man's face when he smiles as he thinks of the trouble "Moore & White" Winders save him, by their ease of operation, beautiful rolls they make, accessibility for cleaning, etc. The "best Winder on the market today," said one of our enthusiastic friends. It's true. Made in four-drum, two-drum, and supercalender types.

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Lowe Paper Co.
Pioneer Paper Co.
Paperboard Corp.
Gardner & Harvey Co.
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Mac Sim Bar Paper Co.
Arrowhead Mills
Falulah Paper Co.
Paraffine Company
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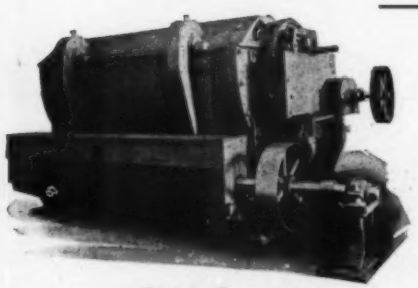
Congoleum Co.
Ohio Box Board Co.
Eddy Paper Co.
Hinde & Dauch Paper Co.
Ball Bros.
American Coating Mills



Rotary Screen

"M&W" Rotary Screen Solves Screening Problems

The Moore & White Rotary Screen will solve your screening problems in a manner that will leave nothing to be desired. Absolutely clean paper, no lumps, low horsepower consumption, no time lost washing up—these features will appeal to the wise paper mill manager.

Falulah Paper Co.
Michigan Paper Co.
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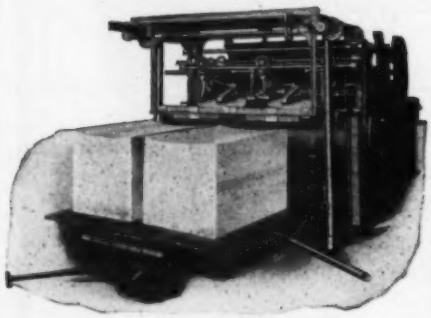
Detroit Sulphite Pulp & Paper Co.
New York & Penna. Co.
Marinette & Menominee Paper Co.
Dill & Collins Co.
Paul A. Sorg Paper Co.
Miami Paper Co.
Crocker, Burbank & Co.
Great Northern Paper Co.
Merrimac Paper Co.
Wardlow-Thomas Paper Co.
Dunn Sulphite Co.
Bemis Bag Co.
Cherry River Paper Co.
Tarentum Paper Co.
Chillicothe Paper Co.
Champion International Co.
Chapin & Gould Paper Co.



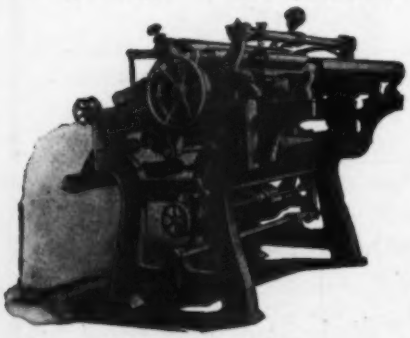
Single Type Lay Boy

A Machine That You Will Be Proud to Own

Not a hen, but a "layer" that sure can pile the paper.

"Moore & White" Lay Boys lay the paper faster and more accurately than human operators, at a great deal less cost. Since first introduced to the trade, they have met with great success, repeat orders coming in right along in large numbers. They have been a real boon to the paper industry. Single, duplex and diagonal types.

Brown Co., Berlin, N. H. (8)
Martin Cantine Co., Saugerties, N. Y. (11)
Champion Coated Paper Co., Hamilton, O. (19)
Crocker, Burbank & Co., Fitchburg, Mass. (3)
Dill & Collins Co., Philadelphia, Pa. (19)
Falulah Paper Co., Fitchburg, Mass. (4)
P. H. Glatfelter Co., Spring Grove, Pa. (6)
Groveton Paper Co., Groveton, N. H. (5)
Hammermill Paper Co., Erie, Pa. (8)
International Paper Co., New York, N. Y. (4)
Kimberly-Clark Co., Neenah, Wis. (18)
Miamisburg Paper Co., Miamisburg, Ohio (4)
Monadnock Paper Co., Bennington, N. H. (5)
New York & Penna Co., New York, N. Y. (7)
Watab Pulp & Paper Co., Sartell, Minn.
Walther Mfg. Co., Brooklyn, N. Y.
West Va. Pulp & Paper Co., New York, N. Y. (44)



Single Type Cutter

Cutters That Really Cut Costs as Well as Paper

Speed and accuracy—those are the two words that mean much to the Superintendent when he thinks of paper cutters. "M&W" Cutters are somewhat higher priced than other Cutters on the market. That we will admit. Considering construction, quality of work produced, long life, they are a paying investment for the man who wants the best. Made in single, duplex and diagonal types.

American Writing Paper Co., Holyoke, Mass.
D. M. Bare Paper Co., Rearing Spring, Pa.
Cherry River Paper Co., Richwood, W. Va.
Chemical Paper Mfg. Co., Holyoke, Mass.
Martin Cantine Co., Saugerties, N. Y.
Crocker, Burbank & Co., Fitchburg, Mass.
Crown-Williamette Paper Co., Portland, Ore.
Columbian Paper Co., Buena Vista, Va.
Curtis Publishing Company, Philadelphia, Pa.
Chillicothe Paper Co., Chillicothe, Ohio
Dill & Collins Co., Philadelphia, Pa.
Hawley Pulp & Paper Co., Oregon City, Ore.
International Paper Co., New York, N. Y.
Jessup & Moore Paper Co., Wilmington, Del.
Kimberly-Clark Co., Neenah, Wis.
New York & Penna. Co., New York, N. Y.
Oxford Paper Co., Rumford, Me.
Oregon Pulp & Paper Co., Salem, Oregon
Strathmore Paper Co., Mittineague, Mass.
Schmidt & Ault Paper Co., York, Pa.
Tarentum Paper Mills, Pittsburgh, Pa.
Union Mills Paper Mfg. Co., New Hope, Pa.
Warren Mfg. Co., Milford, N. J.
Westfield River Paper Mfg. Co., Russell, Mass.
West Va. Pulp & Paper Co., New York, N. Y.

The Moore & White Co.

No. Phila. Station, Penna. R. R. **41st YEAR** **Philadelphia, Pa., U. S. A.**

in the past twelve months as have been furnished by them during any similar period in the twenty-five years they have been building power units for paper mills.

This drive as built today is the result of many years' experience in the design and application of drives for all types of paper machines. It consists of a specially designed turbo-geared unit. A typical set is shown in Fig. 1. The turbine is equipped with a positive acting governor; the reduction gear is herringbone, self-contained type.

This turbine requires no internal lubrication so that the exhaust steam is free from oil and is just as suitable for drying as steam taken directly from the boilers. This not only tends to increase the drying efficiency of the rolls, but also permits the use of condensate returns without danger of oil in the boilers.

The high steam pressures which are being used more and more by paper mills are an advantage rather than a detriment to this type of drive. They increase the turbine efficiency and do not interfere in any way with its operation. Likewise, in the case of high back pressure, which it is sometimes advisable to carry, the Terry drive is ideally suited. The unit may be designed for any back pressure up to 50 lbs. gauge.

To insure a uniform grade of paper and freedom from breaks, a paper machine drive must operate at a constant speed. This drive does this because of its pure rotary motion and its correctly designed governor. This drive is furnished in three different designs, viz., (1) For operating the variable speed shaft of newsprint machines. These units always run at the same maximum speed. A small speed range is, however, usually desirable so the turbine is equipped with a governor permitting a 10 per cent change. This can be increased to 20 per cent wherever conditions warrant it. (2) For operating the variable speed shaft of machines producing various grades and weights of paper. On drives for this service a wide speed range must be available. The drive is, therefore, equipped with a special governor, which may be designed for any range up to 1 to 8. Lightweight or heavyweight paper may be made without any change in the driving equipment other than the adjustment of a small hand wheel. This adjustment is made while the unit is in operation, either at the turbine or from the machine floor by remote control. (3) For operating the constant speed shaft of any machine. As the name implies, this part of the paper machine operates at a constant speed irrespective of the grade and weight of paper made. The drive is for this reason equipped with a standard type constant speed governor.

Methods of Connection

There are various ways in which the drive may be connected to the paper machine. The best method for any one case depends almost entirely upon the mill conditions. To illustrate, however, the simplicity of the connection we have illustrated in Figs. 2 and 3 typical methods which have been successfully employed. Fig. 2 uses the rope drive system with the drive direct connected to the tail shaft. Fig. 3 shows the Marshall system which may be either direct connected or belted as indicated. This type of drive requires small space and relatively light foundations. This is due, in part, to the fact that there are no large reciprocating parts to set up vibrations. An analysis of a number of installations indicated that this drive occupies from one-third to one-half the floor space of a reciprocating engine.

Testing Outfit for Combustion Engineers

A testing outfit for service men, combustion engineers and others interested in the quick determination of combustion efficiency and the cause and location of trouble, has just been placed on the market by the Hays Corporation of Michigan City, Ind.

The outfit consists of a portable flue gas analyzer, steel armored flue gas thermometer and a draft gage, all arranged in a light, compact and strong case convenient for use.

The gas analyzer is the standard Hays Gas Analyzer for determining CO_2 and also if desired carbon monoxide and oxygen. The draft gage is of the adjustable inclined tube type and measures 9 inches in length and 4 inches in height. The range is ½ inch of water either draft or pressure graduated in hundreths. Both the draft gage and the analyzer are self-contained in a leather case and can be carried or used independently of each other.

With this testing outfit it is possible to make a complete check on the efficiency of combustion, flue gas analysis, draft, locating trouble in breeching stacks, through boilers or ducts. Service men are enabled to quickly adjust regulators, dampers, etc., so as to minimize "excess air," maintain high CO_2 and clear up leaky settings, broken baffles, cracks, etc.

The Power Specialty Co., of New York, has taken over the control of the Aero Pulverizer Co., manufacturers of the Aero Unit Coal Pulverizers. This addition gives the Power Specialty Co. facilities to provide complete steam generating units, with the exception of the boiler.

The Bureau of Standards, Department of Commerce, at Washington, has under contemplation researches which will require the service of two Junior Paper Technologists, preferably with training in paper laboratory work. Applications for these positions should be made to the Civil Service Commission, Washington, D. C., requesting announcement and application blank. Receipt of applications will close June 22, 1926.

New Catalogs, Booklets, Etc.

American Cable Co., New York City.—A new handbook for wire rope users has just been published. The book contains information on how to measure wire rope, how to splice, how to correctly socket wire rope, how to care for it, and numerous other bits of useful information. Detailed drawings illustrate methods for making different kinds of slings and fitting equipment.

The Bristol Co., Waterbury, Conn.—Tachometers for recording and indicating the speed of rotation of any piece of revolving machinery, are described in a recent catalog. Both the electric and pneumatic types are set forth, with a number of illustrations and diagrams to aid in the presentation.

Dean Hill Pump Co., Anderson, Ind.—Two new circulars have been received, one of which describes horizontal single suction centrifugal pumps, and the other describes reciprocating deep well pump heads. Both circulars contain illustrations and diagrams.

Foote Bros. Gear & Machine Co., Chicago, Ill.—The latest edition of "Gear Problems" is now ready for distribution. The book is more than a catalog, since it contains engineering information on speed reducers, conveying equipment, gears of all kinds, and a wealth of information on mechanical engineering subjects. The many diagrams, illustrations, and mathematical tables, help to make this a very complete and useful reference book for engineers.

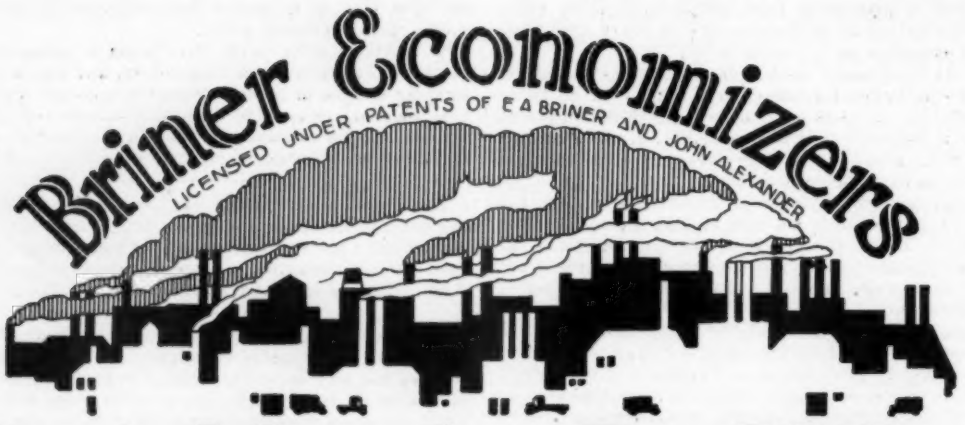
The B. F. Goodrich Rubber Co., Akron, Ohio.—A recently issued catalog describes and illustrates the complete line of rubber goods for the chemical industry. Included in the catalog are several new products which have never before been offered. Among these is the "Vulcalock" process, a process by which soft rubber is vulcanized directly to the metal without requiring an intermediate layer of hard rubber.

Graver Corporation, East Chicago, Ind.—Zeolite Water Softeners form the subject matter of a bulletin just published. It is completely illustrated both with views of installations and of the softener and equipment.

Ingersoll-Rand Co., New York City.—The various types of, and the many uses for oil engines, make up a newly published catalog. The booklet is profusely illustrated and contains many diagrams and installations. The title is "Direct-Injection Oil Engines for all Purposes."

Quigley Furnace Specialties Co., Inc., New York City.—Acid-proof cement, its uses and methods of application, is the subject of a booklet recently received. There are a number of helpful illustrations in the booklet.

Republic Flow Meters Co., Chicago, Ill.—"Steam Economy" is the title of an attractive booklet describing pyrometers and other measuring instruments. The booklet is considerably more than catalog, being a compilation of the experiences of engineers covering a period of over five years on the subject of methods for reducing steam costs. Some interesting and valuable information is contained within.



Saving More than Four Million Pounds of Steam Daily!

Get Ready Now For Next Winter

Get in touch with us now if you are contemplating installation for next Winter. Our capacity is necessarily limited by time.

The advantages of this enormous saving of steam are being shared by mills that are heating and ventilating machine rooms during extreme cold weather with waste heat from machines. The greatest forward step that has been made in machine room ventilation.

Briner Economizers are proving a tremendous power in cutting production costs in the paper industry.

Let us show you what they are doing in mills that you know. You incur no obligation in writing for complete information

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Watch the Mills That Use Them

News Briefs from Washington

Consular Reports

Australian Paper Industry Plans Progressing.—In the January issue attention was drawn to the proposed financial assistance in the establishment of a paper industry in Tasmania. The negotiations between the Australian Government and the London interests which are considering the organization of a pulp industry there are still proceeding. The question of the Government's offer to guarantee £250,000 of a proposed debenture issue was recently discussed in the Tasmanian Parliament and a bill was introduced to "encourage the establishment of a wood pulp and paper industry near Burnie, in the northwest of Tasmania." The bill concerns the proposal of Mr. Gerald Mussen, the promoter of the new company, to take over the options previously held by the Amalgamated Zinc Company, the only difference being that, in addition to concessions granted to the Amalgamated Zinc, the Government will subsidize the industry to an extent by guaranteeing interest for 20 years on the debentures involved in the project. A committee was appointed to inquire into the matter and has recommended that the State should guarantee interest on £250,000 for 15 years.

The Premier of Tasmania in moving the second reading of the bill is quoted as saying that the Ministry is satisfied that the industry will be successful. It would mean a great deal to Tasmania and he considered that the risk the Government was taking in guaranteeing this interest was worth while.

The Royal Commission which is taking evidence in South Australia at present on the manufactures and secondary industries of that State has suggested the possibility of starting in South Australia proper a paper industry for the utilization of straw, a project first suggested there in 1916. The prospects are considered to be favorable inasmuch as many tons of straw can be obtained within 100 miles of Adelaide and the gypsum industry is flourishing there. With regard to the establishment of the industry, the question to be determined is whether there will be a sufficient market for the kinds of paper that could be made from straw, bearing in mind the probable competition from a Tasmanian mill.

German Pulp and Paper Situation.—Official statistics received from the Office of the Commercial Attache at Berlin, Germany, show the output of both chemical and mechanical pulp by the German mills during February to have exceeded the previous month's production and also that of February, 1925. The output of chemical pulp was 81,996 short tons and of mechanical pulp 85,005 tons. Paper production was equal to that of the month of January, the newsprint output reaching 38,661 tons and of other paper 95,945 tons. A smaller percentage of the newsprint produced was exported during February shipments representing only 22 per cent of the month's output, as against 27 per cent for the preceding month.

The situation in the German paper industry during March and April is said to have remained about the same as during January and February. While somewhat depressed for lack of liquid capital, it is not in as disadvantageous a position as certain other lines. After a long period of hesitation the paper cartels finally reduced prices in certain directions, effective April 15, and have been announced as follows:

Woodpulp newsprint, classes I and Ia, reduced 50 pf. per 100 kg.; woodpulp newsprint, classes II to VI, reduced 1 mk. per 100 kg.; woodpulp writings reduced 50 pf. per 100 kg.; ivory tinted cardboard, reduced 2 pf. per kg.; woodpulp blottings, reduced 2 mk. per 100 kg.; woodfree blottings, reduced 2 to 5 mk. per 100 kg.

Swedish Pulp and Paper Prices Firm.—According to Commercial Attache T. O. Klath at Stockholm, Swedish newsprint production during the month of March reached a total of 19,775 short tons, while shipments during the same month amounted to 20,649 tons. France, the United States and Great Britain took approximately half of the total, smaller consignments going to South and Central America and the Far East. With the exception of a slight decrease in price in bleached sulphite, now quoted at from $3.33 to $3.79 per hundred pounds, f. o. b. Swedish port, no changes have been announced in the prices of either pulp or paper.

Studying Means of Improving Currency Paper

The Bureau of Standards is making a comprehensive study of means for improving the wearing quality of United States paper currency. This work is being conducted in co-operation with the Treasury Department, the Bureau of Efficiency, and Crane and Company, the present manufacturers of this paper. The life of the dollar bill has decreased from about 20 months to approximately 6 months, while the use of such currency has increased threefold during the past 15 years. These conditions require the manufacture of over 1,000,000,000 new bills, weighing more than 1,200 tons, annually, to replace worn-out currency. The chief contributing factors to the decreasing life of paper money are, no doubt, a growing rapidity of circulation and also of carelessness in the handling of it. The cost of this annual replacement amounted in 1924 to $4,000,000. The Treasury Department was also faced with the necessity of making costly additions to the Bureau of Engraving and Printing, as its facilities were becoming overtaxed.

The early studies made in 1924 indicated that part of the weakness of the bills was due to their all-linen fiber content, and an admixture of 25 per cent of cotton fiber was recommended with beneficial results. The materials at present being used in the experiments are those in present commercial use and the above combination apparently gives the best results. Modification of the nature of the beating treatment also has a marked influence on the strength of the paper. By brushing out the fibers well and leaving them long, paper of satisfactory printing quality and of at least double the strength of the paper in use was produced with no increase in the cost of manufacture. The very gradual application of roll pressure was found necessary to prevent cutting the fibers too short, and a low concentration of the beater stock proved of advantage in permitting rapid circulation of the stock, with a consequent minimum of hydration. No difficulty has been found in applying these experimental results to commercial mill practice and currency paper with this increased strength is now being supplied.

Another line of research being followed deals with the surface sizing of the printed bills. Such treatment gives them increased life, as it protects them from surface abrasion, gives them better water resistance, and makes the printing more permanent. In the past, animal glue alone was used for this purpose, but it has been found that increased resistance to wear is obtained by hardening the glue sizing with formaldehyde. Bills so treated have been put into circulation for a service trial.

Service records of paper currency are available so far for the old type of money only, but they show that the average life of the dollar bill has been increased to 10 months. The 100 per cent increase in strength of the new type of paper now in use, together with the improved surface sizing, should result in a further material increase in the life of the bill. It is believed that in addition to meeting the increased demand for paper currency with limited expenditures, this work will be of value in the general technique of paper making.

Improved Packing Paper for Export.—The Bureau of Standards has also completed a series of tests of paper for use in conjunction with export packing practice. These tests considered both waterproofness and strength. A type of paper known as duplex asphalted kraft was found most suited to meet the severe requirements. This paper consists of two sheets of strong kraft wrapping paper cemented together with a layer of asphaltum as the waterproofing medium. Such paper has the strength to withstand the many sudden shocks and strains incident to overseas transportation and is extremely water resistant. Tests show no exudation of moisture through such paper in a period as long as 24 hours.

REED SPAFFORD

Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

Improved Paper Machinery Company

Nashua, N. H., U. S. A.

WISCONSIN NEWS

Northwestern Division Holds Spring Meeting

The Northwestern Division of the American Pulp and Paper Mill Superintendents' Association held its spring meeting in Wausau, May 14 and 15. In conjunction with this conference, the Newsprint Service Bureau and the Paper Mill Cost Accountants also held their annual meeting.

Pollution and clean water supplies were among the principal subjects discussed. Joseph H. Slater, of Escanaba, president of the superintendents' association, took a stand on the need of paper manufacturers co-operating with the authorities toward a satisfactory solution of the problems. He declared that the present waste that every paper mill company is sustaining through the practice of dumping refuse matter into the streams can be reduced to a negligible amount by the adoption of proper machinery and equipment, and that the fibrous pollution can be recovered and saved to the paper manufacturing industry through the use of save-alls.

L. B. Warick, Madison, asssitant state sanitary engineer, gave a talk on the same subject. E. P. Gleason, Port Edwards, of the Nekoosa-Edwards Paper Company, told of the company's development of Nepco lake for the purpose of providing a pure water supply. George W. Mead, mayor of Wisconsin Rapids and president of the Consolidated Water Power and Paper Company, spoke to the cost accountants on "The Value of Cost Accounting to Management."

Papermakers Make Tax Revision Plea

There is no hope for the restoration of Wisconsin forests unless the State changes its policy of taxing growing trees, a system that is penalizing rather than encouraging reforestation projects. This statement was made by L. M. Alexander, president of the Nekoosa-Edwards Paper Company, of Nekoosa and Port Edwards, to the state legislative interim taxation committee which conducted a public tax hearing in Wausua on May 28.

He was supported in his views by D. C. Everest, general manager of the Marathon Paper Mills Company, Rothschild. Owners cannot afford to hold timber under the existing taxation laws, and therefore the laws should be changed, Mr. Everest stated. More attention should also be given to protection against forest fires, he said. He said that a tax on timber lands to raise money for fire control would be advisable.

A reorganization meeting of the Valley Paper Mills was held in Appleton on May 26th, at which almost the entire board of directors was changed. The only officer retained was W. F. Wolf, Appleton, secretary. The other officers are H. H. Held, Neenah, president; Ben Koepke, Appleton, vice president; Mr. Bauerke, Appleton, treasurer. The board of directors, in addition to the officers, consists of Eli Defnet, Neenah; John Jaeckles, Kaukauna; and George Wolf, of Theresa. The policy of the board at present will be to save as much as possible of the assets of the company for the stockholders.

Big Interests to Buy Stephenson Co.

Announcement was made recently that the Kimberly-Clark Company, of Neenah, and the Fisher Bodies Company, largest manufacturers of automobile bodies in America, have taken a joint option on the plant of the I. Stephenson Company at Wells, Mich. The option includes timber land, the Escanaba and Lake Superior Railway, and the mills and docks at Wells.

If the deal goes through, Kimberly-Clark Company would utilize the pulpwood of the timber land and the Fisher Bodies Company would use the hardwood. Henry Ford had an option on the same property last year, but failed to exercise it. About a million dollars would be involved in the deal.

The Hersom Paper Company is the name of a new concern organized at Peshtigo, Wis. The head of the company is George H. Hersom, formerly of the accounting department of the Peshtigo Paper Company. The company will cater to the trade of manufacturers, wholesalers and retailers.

New Steam Plant for Consolidated

The Consolidated Water Power and Paper Company, of Wisconsin Rapids, has made plans for the erection of a high pressure steam plant. The plant, in addition to supplying steam for the dryers, will be used to generate power to supplement the water power. A small amount of electric energy had been generated from steam in the past, but the new plant will produce steam at a pressure of 415 pounds. It will be passed through the turbines and generate power as it is reduced to the pressure necessary for the manufacture of pulp and paper.

The company recently bought from George W. Mead and Isaac P. Witter the old Jackson mill which will be used for the purpose of beating up old paper into stock suitable for the manufacture of paper board. This will be used by the Ahdawagam Paper Products Company in the manufacture of cartons and packing boxes.

The Falls Manufacturing Company, of Oconto Falls, has been making plans for the rebuilding of the paper machine for the purpose of increasing its efficiency and producing a higher grade of paper. Changes will also be made in the kraft mill that will aid in increasing production. A new laboratory also is to be built. It is expected that the new improvements will be completed this year.

Among the new wholesale paper houses in the state are the Capital City Paper and Supply Company, of Madison, with a capitalization of $1,000, and with Leo T., W. P. and Sylvester Crowley as the incorporators, and the La Crosse Paper and Supply Company, of La Crosse, of which I. M. Thompson is president and I. M. Miller is manager.

An amendment to the articles of incorporation of the Oneida Power Company, Wisconsin Rapids, has been filed with the secretary of state, whereby the name is changed to Consolidated Water Power Co., and the stock is increased to $1,000,000.

Makes Remarkable Safety Record

Four hundred days without a serious accident in a plant employing approximately 300 persons, was the remarkable record set by the Cellucotton Products Company, of Neenah, a subsidiary of the Kimberly-Clark Company, a few weeks ago. In point of "safety-man" days, the record was 400 years. The age of the safety man is determined by multiplying the consecutive days on which there was no accident by the number of employees.

A day was set aside on which to celebrate the four hundredth anniversary of the birth of the safety man, and prizes totaling $1,350 were awarded to the employees of the company. Ernest Mahler, president of the company, made the forecast that the concern would be employing 800 persons before long.

New Educational Courses Planned

Courses in pulp and paper manufacture to be taught in the vocational schools of Appleton, Kaukauna, Neenah and Menasha, will be completed before fall, and employees of the paper mills in these four cities will be given opportunity to enroll in unit classes dealing with the kind of work they are doing. Harold G. Noyes, itinerant instructor, has been on the field since January 1 conducting a survey of the paper industry in the Fox River Valley. He came here from the East. The survey was submitted at a meeting of about 35 paper mill men representing practically every plant in the four cities. It showed that there are 3,854 persons employed in the 22 mills. Appleton led with 1,444, Neenah was next with 949, then Kaukauna with 832 and Menasha with 629.

No general scheme of education will be adopted this fall because of the divergence in the grades of paper manufactured, the processes used, the shift system, the lack of a well defined system of advancement and other handicaps. For this reason, the short unit basis will be used. The education will be specific training to fit the worker all the better to his job.

SUPERINTENDENTS ARE ALIVE

To the march of progress and improvement in paper making. Backed by the men who pay the bills, the fastest, widest and most modern machines are being equipped with

Millspaugh Suction Couch and Suction Press Rolls

WITH

Positive Rotary Cycloidal Vacuum Pumps

1925 was the best year in our history. First quarter of 1926 twice that of 1925. Additional equipment installed doubling our capacity for Turning, Boring and Drilling Rolls of any size, for machines 274 inch—and up! We recommend our standard construction—TRIED and PROVEN—easy of access, free from any mystery. Bearings plain or anti-friction to meet any service or conditions. We can and will meet the demand of the trade as to size, design and delivery.

[Millspaugh Shower Pipes are in almost universal use—enough said!]

The Paper & Textile Machinery Co.

SANDUSKY, OHIO

Canadian Section

Rapid Growth of the Industry in Newfoundland

Since 1924 there has been a rapid growth of the pulp and paper industry of Newfoundland, and for the present year the estimated daily production is set down as 700 tons, as compared with 550 tons in 1925 and 200 tons in 1924. From a secondary industry pulp and paper will have grown this year to a major industry, rivalled only by the fisheries of the Dominion, which they may even exceed in value this year.

It is reported that negotiations are in progress for the establishment of a third paper making industry with headquarters in the Gander Valley. Ample power is available at a very favorable development cost from the Gander river, and adequate supplies of wood are obtainable. It is not anticipated that the main work of construction will begin before the spring of 1927. The combination of cheap power, abundant wood supplies and favorable shipping location should make this enterprise most attractive, and should be a great step forward in the development of the natural resources of the Dominion.

Two French vessels, the steamers "Briseis" and "Baucie," each with a capacity of 5,000 tons, have been leased by the Canadian Import Co. from the Cie. Auxiliaire de Navigation to carry Canadian woodpulp from the St. Lawrence to British ports this summer. They will make three trips during the season, bringing British coal to this side and returning with Canadian pulp.

The Northland, the new passenger and cargo vessel of the Clarke Steamship Co., has begun its fortnightly service between Montreal and Corner Brook. It will stop at Quebec and all points of importance on the south shore from Cape Chat to Gaspé Basin.

Two distinguished representatives of Norwegian paper manufacturing circles, John Strindlund and L. J. Dorenfeldt, are making a tour of Canadian pulp and paper mills, studying production methods.

In reply to an inquiry by Right Hon. Arthur Meighen, Conservative leader in the Parliament at Ottawa, as to whether any action was being taken by the Government with respect to the exportation of pulpwood, Premier King briefly replied that the question was under consideration.

F. T. Kaelin, consulting engineer and advisor to Shawinigan Water & Power Co., recently left for a six months' vacation in Switzerland in the interests of his health. Though business for his electric steam boilers in the United States has dropped off in the last two years, Mr. Kaelin stated that the demand in Canada has increased rapidly and there are now over 400,000 kilowatts of the Koelin type of boiler operating in this country. One of the notable recent installations is that of a 20,000 kilowatt steam generator for the Abitibi Power & Paper Co., designed for a working pressure of 200 lbs. per square inch and with a normal capacity of 60,000 lbs. of steam per hour.

QUEBEC

Fire at Forest Products Laboratories

Fire broke out early last month in the building occupied by the Pulp and Paper Division of the Forest Products Laboratories, at Montreal. The flames reached the roof and threatened to spread. The firemen had some excitement when gas from a compressed sulphur dioxide tank suddenly escaped while they were at work on the top floor. The blaze was soon extinguished, but considerable damage was done.

The fire was confined quite closely to the office and reading room at the head of the stairway in the newly fitted part of the building. These rooms suffered very seriously, and the contents, including many important and valuable papers, were severely damaged. Some damage was also done to a room which was just being fitted up as a laboratory, and the insulation of the new constant humidity room was injured. A number of paper testing instruments in this room at the time were damaged by water, but are being reconditioned.

Price to Double Capacity of Riverbend Mill

The annual report of Price Bros. & Co., Ltd., states that profits for the year show a gain of over 33⅓ per cent over those for the previous year at $4,263,190 as compared with $3,128,125, and after deduction of substantially higher interest charges at $786,096, depreciation of 51,199,604, and appropriation of $482,369 for restoration at Kenogami, net income available for dividends is shown at $1,795,121 as compared with $1,338,761, while preferred dividends of $455,000 left net available on common at $1,340,121 as against $1,338,761.

In his remarks to shareholders, President John H. Price stated: "The construction of the newsprint mill at Riverbend was completed in accordance with program and was producing marketable paper in the latter part of December, 1925. This mill is running satisfactorily and producing a good quality of newsprint, almost to capacity. We are now carefully planning the increasing of the mill from 200 tons to 400 tons daily capacity, which will bring it to what we consider an ideal unit for economic operation. This will make the total capacity of your company's mills equal to 950 tons daily, or 290,000 tons per annum. For this we do not intend to dispose of any further securities of the company."

This intimation means that Price Bros. will come second only to International Paper Co. in the world as a producer of newsprint.

An order-in-council has been passed by the provincial cabinet and signed by the Lieutenant-Governor, granting the Shawinigan Water & Power Co. permission to construct a transmission line from Quebec to Ile Maligne, in the Saguenay district, to bring power from the Duke-Price power house at Grande Décharge. It is believed the entire work of construction of the line will cost in the neighborhood of $6,000,000.

Current rumors make it seem likely that the head offices of the Duke-Price Power Co. will be removed from Quebec to Montreal, where it is understood that the company will be housed in the Canada Cement Building.

Recent Ottawa incorporations include Elliott-Fairchild Air Service, with a capital stock of $100,000 and headquarters in Montreal, and Northern Ontario Pulp & Paper Co., capital stock $4,000,000 and headquarters in Montreal.

First Commercial Airplane Launched

Canadian Vickers launched last month the first commercial airplane to be constructed in Canada for a commercial company, this being their "Vedette," which is of the latest design and fitted with the most modern engine in existence. The machine, work on which was commenced six weeks previously, was built for the Fairchild Aerial Surveys, Ltd., Grand' Mère, and, following tests made by that company's premier pilot, K. F. Saunders, was found to be in every way satisfactory and will be pressed into service immediately.

This "Vedette" machine is a flying boat built especially for forestry patrol and protection, aerial photography and reconnaissance. It is to be employed by the firm of Jas. D. Lacey

Builders of High Class

Paper Making Machinery

I. P. Morris and Pelton
Hydraulic Turbines and Accessories

4-270" High Speed News Machines are now under construction for a new Canadian Mill, and embody the following special features:—

Van de Carr Slices.

Oscillating Suotion Boxes.

Suction Couch Rolls.

Suction Press Rolls.

Canadian Granite Top Press Rolls.

Antifriction Bearings on Breast, Table, Wire, Wet Felt and Dryer Canvas Rolls.

Worm and worm wheel driving mechanism for dryers, to ensure safe running at high speed.

Provision has also been made for mechanical handling of the heavy rolls when changing wires and felts.

P17

DOMINION ENGINEERING WORKS
LIMITED
MONTREAL CANADA

See page 338 in the 1925 Paper and Pulp Mill Catalogue

& Co., forestry engineers, for a forestry survey in the Gatineau district, the pilot attached to the ship for this purpose being H. M. Passmore, who recently returned from Florida, where he was employed by the Fairchild Company.

International Plans Greater Power Developments

At the present time, International Paper is building at Chelsea a dam 1,600 feet long with a maximum height of 109 feet, and at Farmer's Rapids, about three-quarters of a mile below Chelsea Island, another dam which will have a total length of 4,800 feet and a maximum height of 75 feet. The power house at the former location will have four 30,000 h. p. turbines and generators; while the lower development will have four 21,000-h. p. units. On the Upper Gatineau, 35 miles above Maniwaki, the company is constructing a dam which will impound the headwaters of the river in a vast storage lake which will collect the drainage from an area of 6,200 square miles. The purpose of this is to insure a reasonably uniform flow of the river the year around, reducing spring freshets to a minimum, and eliminating unduly low water conditions in summer and fall. In other words, the company is doing for the Gatineau what the Quebec Government has already done for the St. Maurice, Kenogami, and other rivers.

It has officially been announced that International Paper has purchased outright the Hull Electric Co., in its entirety, and not merely a block of stock as had been reported. Plans and surveys have already been made, according to Chief Engineer A. H. White, for the development of Paugan Falls. Development work has not yet been started, but is expected to commence in the near future. Mr. White also stated that there is a possible development of 600,000 h. p. on the Gatineau River properties controlled by International Paper, and that the developments at Paugan Falls, Chelsea and Farmer's Rapids will deliver 405,000 h. p. Of this amount 230,000 to 260,000 h. p. has been contracted for by the Ontario Hydro-Electric Power Commission and will be furnished almost entirely by the Paugan Falls development; 36,000 h. p. will be required by the pulp and paper mill at Templeton; and 50,000 has been allocated for use in the Province of Quebec. Any surplus power will probably be used for steam generation at the paper mill, until such time as a more profitable market is found for it.

The paper mill at Templeton is scheduled to be in operation by July 1st, 1927, with a rated capacity of 450 tons of newsprint a day; and it is being laid out in such a manner that it can be doubled or trebled in size when conditions will warrant the expansion.

There is a possibility of the projection of another power development at Six Portages, or Nigger Rapids, on the Gatineau River, near Burbridge, which is under consideration, and from this source 65,000 h. p. would be available, if developed as a low unit proposition.

The electric installation at the Kipawa high-grade bleached sulphite mill is to be increased from 6,000 to 24,000 h. p.

Another News Mill Near Quebec City

The same financial interests which are back of the Spanish River and Abitibi companies are stated to be concerned in the organization of a separate concern known as the St. Anne Power & Paper Co., which is to build a newsprint mill near Quebec, with a rated capacity of 200 tons per 24 hours. The first machine is expected to be in operation in April, 1927, and a second machine is expected to be producing a few months later.

The syndicate is headed by Alexander Smith, president of Peabody, Houghteling & Co., of Chicago, and he is associated with Geo. H. Mead, head of one of the biggest newsprint distributing organizations in America. The same organization is interested in the Manitoba Paper Co., which is now building a mill near Winnipeg, and in the Fort William Paper Co. and the Kamanistiquia Power Co.

J. T. Donohue, of Quebec City, is president of the new company.

Announcement has been made of the formation of the new firm of Clement King & Co., which will represent the following well-known firms in the paper industry: Penmans, Ltd., B. F. Goodrich Rubber Co., and the .Richard L. Cawood Co. Clement King, head of the new company, is well known in the paper industry, having been with International Paper at Three-Rivers, and subsequently purchasing agent of the St. Lawrence Paper Mills, Ltd. His first venture in selling was with the Morey Paper Mill Supply Co., of Boston, whose Canadian manager he has been since 1923. He has now acquired their interest in the Canadian company and has formed the new firm.

The Township Council of West Hull has agreed to grant a fixed assessment of $750,000 on the property of the Canadian International Paper Co. for a period of twenty years.

Four field parties from the Montreal office of Jas. D. Lacey & Co. (Canada), Ltd., recently completed the field work on 1400 square miles in the Lower Ottowa Valley region, northwest of Pembroke, for J. R. Booth, Ltd., of Ottawa.

H. J. Webb, of the Canadian International Paper Co., is on a six weeks' tour of England and the continent. The trip is one of both business and pleasure.

G. W. Charters, assistant superintendent of the Laurentide Company's mill at Grand'Mère, has been appointed superintendent of the E. B. Eddy plant at Hull, Que.

Rubber-Covered Rolls to Be Made in Canada

The American Wringer Co., Ltd., of Canada, has been incorporated to carry on the extensive Canadian business heretofore handled in the Dominion for the American Wringer Co., of Woonsocket, Rhode Island. The factory of the Canadian company, including a plant for the manufacture of rubber-covered rolls is located at Farnham, and operations are due to begin today.

Notices have been sent out from the office in Toronto of the secretary of the Canadian Paper Box Manufacturers' Association, giving the corrected dates of the annual convention at Montreal as Monday and Tuesday, June 21st and 22nd, instead of June 28th and 29th as had originally been announced.

Geo. A. Day, who has for some time past been manager of Industrial Laboratories, at Thorold, Ont., has taken a position on the technical staff of the Brown Corporation, at La-Tuque, Que.

Ned Smith, manager of the Cornwall mill of the Howard Smith Paper Mills, has been appointed assistant to the managing director, and will move to the head office of the company in Montreal about July 1st. Mr. Smith's place has been taken by E. K. Robinson, formerly manager of the Gaspé Timber Limits, and widely known in pulp and paper circles, who becomes manager of the Cornwall mill.

A preliminary report on Sunday work in the pulp and paper industry in the province has been submitted to Premier Taschereau by the special commission which was appointed to make a thorough investigation of conditions which might require a certain amount of labor to be carried on in various plants in the province. The complete and final report is expected to be submitted shortly.

Ontario Paper Starts Outarde Falls Development

Work on the development of some 40,000 h. p. on the Outarde River, on the north shore of the St. Lawrence has been started by the Ontario Paper Co. Some three hundred men will be engaged on the water power development work, and as soon as this work is completed construction of a mill with a minimum daily production of 100 tons of newsprint will be started.

Manicouagan, which has been selected as the site for the pulp and paper mill, is about four miles from the power site. According to officials of the Ontario Paper Co. and of the Anglo-Canadian Pulp and Paper Co., which both have interests in that district, Manieougan is destined to become within a few years a city of over 10,000 inhabitants. Plans

C-E AIR HEATERS

Put Escaping Flue Gases to Work

Escaping flue gases are full of heat which has cost money to produce.

C-E Air Heaters utilize this heat to raise the temperature of the air supplied for combustion.

Units equipped with C-E Air Heaters have demonstrated worth-while savings.

Ask for complete information

COMBUSTION ENGINEERING CORPORATION
POWER PLANT LIMITED EQUIPMENT

STOKERS OF ALL TYPES
PULVERIZED FUEL SYSTEMS
STEAM TURBO-GENERATORS
(HIGH SPEED STEAM ENGINES)

AIR PREHEATERS
RADIAL BRICK CHIMNEYS
COAL HANDLING EQUIPMENT
ASH CONVEYORS AND HOPPERS)

SUSPENDED FLAT ARCHES
DE-AERATORS
CONDENSERS OF ALL TYPES
OIL BURNING EQUIPMENT

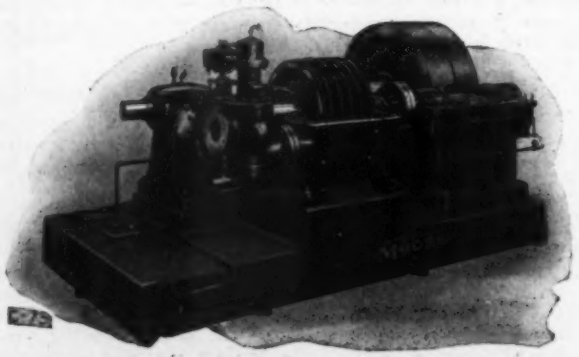
PULVERIZING AND GRINDING MILLS
GRINDING INSTRUMENTS
INDUCED AND FORCED DRAFT FANS
DIESEL OIL ENGINES

HEAD OFFICE—TORONTO VANCOUVER, MONTREAL, WINNIPEG

MOORE

THE IDEAL PAPER MACHINE DRIVE

"Best at every turn"



Moore Multi-Stage Turbine and Double Helical Reduction Gear

Locate a Moore turbo-geared unit at the correct place in the main line shaft drive.

Ample flywheel effect is secured from the gear, speed variation is perfectly controlled, space is vastly minimized and overall efficiency increased.

Present users heartily indorse this equipment.

Complete details upon request.

Steam Turbines Centrifugal Pumps Reduction Gears

Offices in all principal cities

MOORE STEAM TURBINE CORPORATION
WELLSVILLE, NEW YORK

In Canada
Ontario and East: General Supply Co. of Canada, Ltd., Ottawa
Manitoba and West: Darling Bros., Ltd., Montreal

are being laid down for the town, which will be the first model city on the North Shore.

Hon. Honoré Mercier, Minister of Lands and Forests at Quebec, spent a week at Manicouagan and other points along the North Shore on an inspection trip of the work being carried on in that district in connection with pulp and paper developments.

Chas. Donohue, of Quebec, vice-president of Donohue Bros., was recently married in France to Miss de St. Gillis, a nurse during the war. The civil ceremony was performed at Senator Menier's Chateau de Chenonceaux, and the religious ceremony in the Church of St. Honoré Deylau.

The Dutch freighter "Terneuzen" and the Norwegian steamer "William Blumerr" recently loaded 3,500 and 5,500 tons of groundwood, respectively, at Port Alfred, and sailed for an English port.

W. I. Crombie, of the Budge Carbon Paper Co., has been elected member of the executive committee of the Quebec Division of the Canadian Manufacturers' Association.

J. J. Harpell, of the Industrial and Educational Publishing Co., Henri Rolla, of the Rolland Paper Co., C. Howard Smith, of the Howard Smith Paper Mills, A. D. Huff, of the Canadian International Paper Co., and J. A. Bothwell, of the Brompton Pulp & Paper Co., are among the newly elected members of the executive committee of the Montreal Branch of the Canadian Manufacturers' Association.

The first machine of the new Port Alfred mill, which was scheduled to start up in July, was started in the last week of May.

Following an understanding reached between Messrs. H. M. Wilson, general manager of Price Brothers at Rimouski, C. M. Christenson, assistant manager, G. A. McLaughlin, manager of the groundwood mill, and Canon Elzear J. Roy, parish priest of the Cathedral, it has been decided that when the spring work is resumed there will be no work in the Chicoutimi groundwood mill between midnight Saturday and midnight Sunday.

Wayagamack Pulp and Paper Co. have secured an option on the island of Anticosti, owned by Senator Menier, of France. Gustave Piché, chief forestry engineer of the Province of Quebec has been authorized by the provincial government to go on leave for a sufficient period to make the inventory of the forestry resources of this island. Several other experts will accompany him, and it is expected that the work will be completed in the middle of July. Estimates now place the area of the island at about 4,000 square miles over 80 per cent of which is timbered.

On the occasion of his 75th anniversary, on May 13th, Mr. S. J. B. Rolland, one of Canada's foremost paper makers, received congratulations from many friends and special attention from those connected with the Company over which he presides. The directors, staff and employees of the Rolland Paper Co. honored their president by the presentation of a gold watch.

The appointment is announced of Cecil E. Thompson as assistant to Geo. M. McKee, who is president of the Port Alfred Pulp & Paper Corporation and managing director of the St. Maurice Valley Corporation. Mr. Thompson has previously been Montreal manager for H. S. Taylor, consulting pulp and paper mill engineer, and has been associated with many large pulp and paper mill developments in Canada.

New Paper Making School Plans Discussed

At the regular monthly meeting of the committee appointed by the Canadian Pulp and Paper Association to advise and co-operate with the faculty of the School of Pulp and Paper Making, at Three-Rivers, the principal subject discussed was the planning of a curriculum that would cover the essentials of pulp and paper making in a period of two years, and at the same time to make provision for unit courses for those who wish to confine their study to obtaining a better understanding of their own particular job.

Another feature of the work for next year that was favorably considered was the arrangement for a series of monthly convocations, at which would be given illustrated talks on the various phases of pulp and paper making, together with the conversation and marketing of the product.

Centralizing Newsprint Sales

It is learned that there is no question of St. Lawrence Paper Mills entering a merger with St. Maurice Valley Corporation, as was rumored recently. The plan under discussion is to be solely in reference to St. Lawrence linking up with St. Maurice Valley Sales Corporation, a proposition which refers only to the distributive side of the business, not to the manufacturing end.

St. Maurice Valley Sales was organized a few weeks ago to handle the selling of the products of St. Maurice, Belgo and Port Alfred mills, the two former having been recently merged by St. Maurice Valley, while Port Alfred is closely allied through board relationships. It is now proposed to extend the scope of operations of this sales organization by securing the co-operation of other unattached companies, with a view to strengthening the marketing end of the business.

In view of the openly expressed fears of over-production with the advent of new output in various parts of the country, it is stated to be the policy of the more powerful organizations to secure co-operation in distribution, with a view to minimizing the dangers of price cutting.

The Eastern Paper Felt Mills, at St. Basile, will soon be producing straw board in various grades and weights. A number of improvements in the property have been made since the new owners have taken hold. The management has engaged the service of A. O. Bragg to assist in getting production going on the new lines. Mr. Bragg is a graduate in pulp and paper technology from the University of Maine, and since graduating has had extensive experience with the Beaverboard Companies, Robert Gair, Standard Paper Co., and others.

Hon. Honoré Mercier, Provincial Minister of Lands and Forests for Quebec, has signed a $100,000 contract with a French hydroplane company for a complete survey of the Gaspé peninsula during the next two years. It is also expected that nearly all the Lake St. John and Chicoutimi districts will be surveyed during the present year.

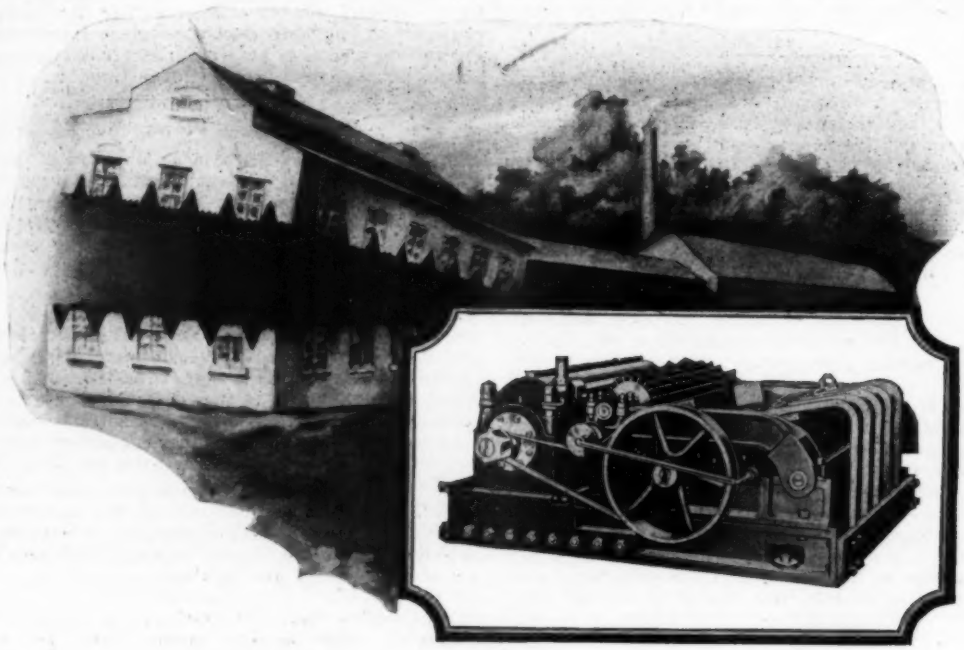
Officials of the Donnacona Paper Co., of Donnacona, have denied the report of the transfer of control of the property to interests close to the St. Maurice group.

Continuing the system adopted two years ago to prevent circulation in the forest during the season when forest fires are likely, an order-in-council has been passed declaring that the forests of the province will be closed from the 1st of May to the 15th of November. Permits are easily obtainable.

ONTARIO

Kimberly-Clark and New York Times Jointly Interested in Large News Mill

The Spruce Falls Power & Paper Co., Ltd., has received a provincial charter authorizing the construction and operation of large hydroelectric power plant, pulp and paper mills at and near Kapuskasing, on the water courses flowing into Hudson Bay. At the same time Kimberly-Clark Co., of Neenah, Wis., owners of all the capital stock of the Spruce Falls Co., Ltd., have entered into an agreement to transfer all the assets of the latter company to the Spruce Falls Power & Paper Co., and have also entered into an agreement with



The Logical Mouth of the Paper Mill

Beaters are ofttimes referred to as the "stomach of the paper mill," but in many cases they are also forced to perform the functions of a mouth. A beater is no more designed for "chewing-up" solid pulp laps or sheets than our own stomachs are fitted to digest solid masses of unchewed food and the effects of compelling either to do so are similar.

When solid masses of pulp are jammed into the beater, 25% of the total beating time is, in many cases, actually "chewing-up" time. Aside from this loss of time, labor and production,—the constant danger of jumping the roll or plugging the backfall conclusively proves that a beater should not be used as both a stomach and a mouth.

Beaters are designed for drawing out the pulp fibres whereas, the Arpeko Shredder is designed to chew the pulp into particles slightly larger than a postage stamp. This shredded pulp allows a denser furnish, disintegrates quicker, flows easily under the roll and is less liable to plug the back fall. The pulp is shredded instead of cut because water penetrates its torn, open edges quicker than closed, knife cut edges. Furthermore, water is introduced at the shredding point under extremely favorable conditions (like, and for the same reason that, saliva flows in our own mouths) thus hydration is well advanced before the pulp leaves the shredder.

Since the Arpeko Shredder relieves the beater of preliminary mastication of pulp, thereby greatly increasing production—it is the Logical Mouth of the Paper Mill.

Literature on Request

Salient Features

(1) Suitable for dry, partly dry or partly frozen, laps, sheets or rolls.

(2) 50 H. P. Motor will operate at rate of 4 dry tons of hard kraft sheets per hour.

(3) Only 5 H. P. required to start and bring up to running speed.

(4) Timken Roller Bearings insure long life and save Power, Lubricant, Time and Repairs.

(5) Revolving blades will shred 400 dry tons without changing.

(6) Blades can be removed, conditioned and replaced by one man in three hours' time.

(7) Pulp is shredded or torn, not cut, insuring easy hydration.

(8) Shredded product contains 25% water, due to shower at shredding point.

ARPEKO

Pulp Shredder ~ Chip Screen ~ Wood's Ideal Chip Breaker

RYTHER & PRINGLE CO.

Carthage, New York

the New York Times Co., publishers of the "The New York Times," whereby they became jointly interested in the new company.

The full development of the enterprise involves an investment of about $25,000,000, the production of 500 tons a day of newsprint, and the generation of the electric power required for the pulp and paper mills and possibly also for other puposes.

The Construction work is already under way, the plans having been drawn up by Geo. F. Hardy of New York.

Construction Starts in Soda Mill in Cornwall

Ground was broken a couple of weeks ago for the building of the home of a new industry in Cornwall, the Canadian Cellulose Company, which is erecting a soda mill on part of the property at present owned by the Howard Smith Paper Mills. The soda mill will contain two digesters and will have a daily capacity of 50 tons of bleached soda pulp.

The mill is to be up-to-date in every detail, incorporating many new ideas which have not yet been tried out either in Canada or the United States. The plant will employ about 50 men and should be in operation early next year. The contract for the construction has been let to the Belmont Construction Co., of Montreal, some of the contracts for the machinery have already been let, and the balance will be awarded as soon as possible.

Hon. Charles McCrea, Minister of Mines for the Province of Ontario, speaking at Haileybury recently, said that the Ontario Government had completed a survey of the pulp and paper resources of the north and found that a doubling of the output could be brought about without unduly depleting the source of supply. Within the next three years some $85,000,000 will be expended in the expansion of this important industry in Northern Ontario.

Injunction Delays Sale of Mattagami Assets

By an injunction executed on behalf of the unsecured creditors, the assets of the Mattagami Pulp and Paper Co., Toronto, whose plant is located at Smooth Rock Falls, are still in possession of the old company. The sale, which was to have been held in Toronto some time ago, was postponed till October 10th. In the event of no higher bidding being obtained at the sale the debenture holders will acquire the assets; they in turn will pay off the old bondholders with accrued interest to date.

The debenture holders will transfer the assets to a new company and will receive one $100 share of 7 per cent cumulative preferred stock and one share of common stock of no par value in exchange for every $100 debenture share which the present company has outstanding. The new company will issue first mortgage bonds and the proceeds will be used to pay off the old bondholders and other outstanding liabilities.

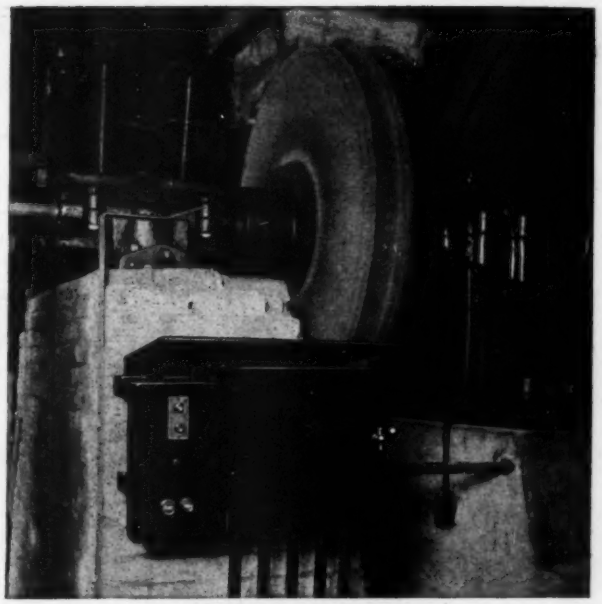
The world's widest paper machine, which produces a sheet 245 inches in width, is now in operation at the plant of the Kenora Paper Mills, Kenora. When it is properly tuned up, it is expected to produce about 150 tons of newsprint every 24 hours.

Strawboard Mill at Trenton

The Hinde & Dauch Paper Co. of Canada, Toronto, of which O. H. Moore is managing director, will erect a fifty-ton strawboard mill at Trenton, Ont., about 100 miles east of Toronto. Excavation was started early last month, and the work is being carried out by W. J. Trimble, of Toronto.

The contract for the machine, which will turn out a sheet 112 inches wide, has been placed with the Downingtown Manufacturing Co., East Downingtown, Pa. The Hinde & Dauch Co. will erect two large buildings and the strawboard from the new mill will be used in connection with the corrugated paper box and container business in Toronto. It is expected that the strawboard mill will be in operation by the end of the present year.

Charles V. Syrett, who for the past seventeen years has



C-H 60ᴴᴾ Clutch on beater drive
Frank Smith Paper Co., Middleton, Ohio

C-H Clutches on the beater drive

"As easily as snapping on an electric light" —that is the way this 500 h. p. synchronous motor is made to pick up the load. By touching a button, the C-H Magnetic Clutch applies the load without jerk or jar to motor or beater after the motor has attained synchronous speed.

Paper mills everywhere are solving this question of "starting torque" and getting the power-factor benefits of synchronous motors by using these clutches. There are other advantages too, such as—quick stopping in emergency, control at most convenient location, and many special applications to provide automatic operation.

Every mill superintendent and engineer should read the C-H Clutch booklet. A line from you will bring your copy at once.

The CUTLER-HAMMER Mfg. Co.
Pioneer Manufacturers of Electric Control Apparatus
1254 St. Paul Avenue
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Send for This Booklet
A world of clutch information for the operating executive. Complete data on C-H Clutches with photographs of many installations. This interesting booklet is yours on request. Just ask for Publication P-11

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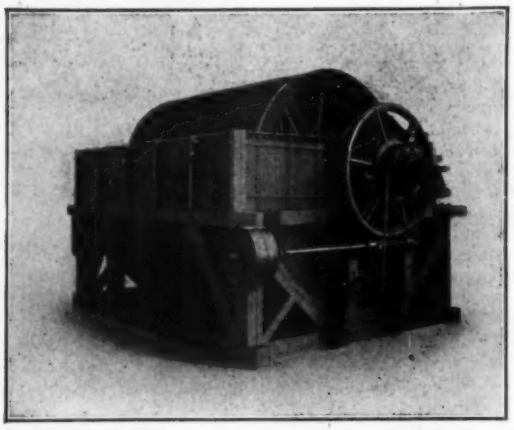
Industrial Efficiency Depends on Electrical Control

Three Operations at One Time



(From a report on this Oliver operating on de-inked stock.)

"Keep in mind that the Oliver does three operations in one. Recovers otherwise waste pulp and filler from **all** of the White Water, washes out **all** bleach and bleach products, and thickens the stock from 0.5% air dry to 10% air dry.

Capacity 40 tons air dry. Forty gallons per minute wash water. Filtrate contains 6 to 8 grains total insolubles per gallon. No fibre visible in filtrate and of the total lost solids 70% are ash. Filtrate averages 1,485 gallons per minute.

This stock is a mixture of sulphate and soda pulp with clay filler and has low freeness because of the cooking and beating ahead of the Oliver."

OLIVERS

are being used in
seven different Paper Manufacturing Operations
Seventeen Olivers were shipped to Paper Mills in April

Oliver Continuous Filter Co.

San Francisco
802 Cunard Building

New York
1422 Aeolian Building

London
11 Southampton Row

Johannesburg, South Africa
E. L. Bateman, The Corner House

See page 390 in the 1925 Paper and Pulp Mill Catalogue

been connected with the Victoria Paper & Twine Co., Toronto, has resigned from the position of managing director of that company and allied concerns, the Garden City Paper Mills, St. Catharines, and the Canadian Vegetable Parchment Co., Merritton. Mr. Syrett's plans for the future have not been decided, but before entering upon new activities he will take a well earned rest.

International Paper Company is reported to be concluding negotiations for the purchase of the pulp mill of the Northern Ontario Light & Power Co., at Haileybury. The new owner plans for enlargements in the plant, including improvements in the present mill with additional machinery for increasing the output.

Supplementary letters patent have been issued changing the name of the Waterous Engine Works Co., Ltd., to Waterous, Ltd. This change has been decided upon in order to bring the name of this company more in keeping with its present line of manufacturing, that of engineers, machinists, and general founders, in addition to that of their old established lines of pulpmill and sawmill machinery, boilers, engines, tanks, road rollers, etc. The company is one of the oldest manufacturing concerns in Canada, dating back to the partnership of P. C. Van Brocklin and C. H. Waterous, Sr., in 1848.

Fort William Pulp and Paper and Kaministiquia Power are reported to be forming a holding company to be named Fort William Power. The paper company last year acquired Kaministiquia from Montreal interests. Spanish River interests now control both Fort William companies. Both plan extensions. The new power company is expected to float collateral trust bonds.

The case for the defense has begun in the courts at Toronto in regard to the action of John Stirrett & Co., lumber and pulpwood dealers, of Port Arthur, against the Kaministiquia Power Co. and the Hydro-Electric Power Commission of Ontario. The amount of damages asked for is $400,000, on the ground that Kaministiquia, which controls the waters of Dog Lake for power purposes, used the dam in such a way that Stirrett's logs were tied up and could not be released until October, too late for profitable sale.

The town council of Fort Frances recently decided to close certain streets in order to allow the Fort Frances Pulp and Paper Co. to make extensions to their mills. The company has over 1,000 men at work constructing tributary power plants and building transmission lines. This force will shortly be increased to 1,500. By the closing of the streets, the company's water frontage will be enlarged.

The plant and equipment of the Ross Can Co., Ltd., manufacturers of metallic and fiber containers, Bowmanville, has been sold by public auction. The plant had not been in operation for some months. Machinery, tools, etc., were valued at $114,000.

Three carloads of pulp were burned recently in a spectacular blaze which completely destroyed the storage sheds of the Provincial Paper Mills on the Credit River, at Georgetown.

S. F. Duncan, of the Provincial Paper Mills, and W. J. Trimble, contractor, have gone to Port Arthur, preparatory to installing the new machine in the company's mill in that city. At a cost of approximately $500,000 the Port Arthur Division of the company is erecting four buildings in order to accommodate additional equipment which will increase the capacity by 80 tons a day.

Doings at Iroquois Falls

The fourth unit of the power plant at Island Falls started running on the 1st of May.

The building program for this summer includes twelve houses, a new Town Hall, renovation of the old Town Hall, and a new Woods Office.

The passing of the 550-ton mark in newsprint production, which was accomplished on April 20th, was celebrated by a

Waldron Machines

For 99 Years The Choice Of The Paper Industry For

COATING PRINTING

Processing Paper

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WRITE TO OFFICE NEAREST YOU.

Admission: One Bone

POMPEII with its theatre tickets of carved bone found guidance and entertainment in the offerings of the stage. Good and evil, reward and punishment, guile and innocence, the whole worked up into a cross section of life, have held the same keen interest through the ages.

In Pompeii the crier announced the coming of the play. These days we read the advertisement in our favorite newspaper. Then, the scene was explained by voice; now, we refer to our program. Then, a slab of bone served a long life as a ticket; now, we print a new batch of pasteboards for each performance.

The play is still the thing, but its technique has changed. Much of its burden of detail has been given to paper to carry.

HAMMERMILL PAPER CO.

ERIE, PA.

banquet on the night of May 1st, offered by the company to all its employees. In order not to interfere with shift work, it was served in two sittings. A total of 1,067 attended the dinner.

L. E. Schlemm, landscape engineer, recently spent a couple of days in the town laying out work for the summer, including the work on the golf links.

MANITOBA

The Weiner-Brownell Pulp and Paper Company are erecting a new paper mill at St. Boniface. Excavation has started and partial construction of one section of the building to be erected continues though final plans for the mill have not yet been completed. Mr. Weiner and Mr. Brownell are working in conjunction with W. D. Barker, managing-director of the Northern Engineering and Development Company, in the completion of the plans.

S. W. Backus, vice-pres., Fort Frances Pulp & Paper Co., Fort Frances, Ontario, has stated that a pulp mill will be erected by his firm at Winnipeg, provided satisfactory arrangements can be made for getting power.

In attempting a landing on Moose Lake recently, W. A. Weaver, of the Dominion Forestry Patrol, crashed when his seaplane lost its flying speed. The pilot was not injured.

Work on the new pulp and paper mill at Fort Alexander is progressing very satisfactorily, and is ahead of schedule, so that it is expected to be ready for starting operation by November 1st. L. E. Schlemm, landscape engineer, spent a few days at the town site with P. A. Trost, of New York, one of the company's engineers. Mr. Schlemm, who has been entrusted with the laying out of the townsite, says that the town will be very beautiful. There are splendid elms and maples growing naturally, and he has planned the town so that none of these will be destroyed.

ALBERTA

An effort is being made to establish a straw paperboard industry in Alberta and public meetings have been held at which addresses have been delivered. J. Bache-Wiig outlined the process of which he is the originator, and B. W. Green gave plans for financing and marketing of the product. Drumheller interests are actively endeavoring to have the proposed plant established there, but Messrs. Bache-Wiig, McKee and Green, who are organizing the $75,000 company, would like to locate in Edmonton if a site near the municipal power can be secured from the city. "We are going to locate the initial plant in Alberta," Mr. McKee stated, "but it will depend on negotiations in the near future what point we will decide upon."

BRITISH COLUMBIA

B. C. Pulp Paper Operating Satisfactorily

In consequence of the satisfactory demand for Canadian sulphite in trans-Pacific markets, coupled with operating economies and aggressive marketing methods, it is understood that British Columbia Pulp and Paper, of Vancouver, is in a very satisfactory financial position at the present time. Under the management of Lawrence Killam the two principal sulphite mills of the company at Woodfibre and Port Alice, have been operating at capacity, producing and shipping about 5,000 tons of high grade sulphite per month, mainly to the Japanese market, which is becoming an increasingly important consumer of Canadian chemical pulp.

It would appear that, with post-war market difficulties now fully adjusted, and with the practical assurance of no serious setback in the prosperity of the Canadian sulphite industry

Felts are softer when washed with Oakite

Oakite Service Men, cleaning specialists, are located at

Albany
Allentown, Pa.
*Atlanta, Ga.
Baltimore
Boston
Bridgeport
*Brooklyn
Buffalo
Camden
Canton, O.
Charlotte, N. C.
*Chicago
*Cincinnati
*Cleveland
*Dallas
*Davenport
Dayton
*Denver
*Des Moines
*Detroit
Erie
Flint, Mich.
Grand Rapids
Harrisburg
Hartford
*Indianapolis
Jacksonville, Fla.
*Kansas City
*Los Angeles
*Milwaukee
*Minneapolis
*Montreal
Newark
New Haven
Newburgh, N.Y.
*New York
*Oakland, Cal.
Philadelphia
Pittsburgh
*Portland, Ore.
Providence
Reading
Rochester
Rockford
Rock Island
*San Francisco
*Seattle
*St. Louis
Springfield, Ill.
Syracuse
Toledo
*Toronto
*Tulsa, Okla.
Utica
*Vancouver, B. C.
Waterloo, Ia.
Williamsport, Pa.
Worcester

*Stocks of Oakite materials are carried in these cities.

THE advantages of Oakite for washing felts are many. First, felts are softer, more absorbent and cleaner. They last much longer. Most important, the time of washing is appreciably shortened in all cases, and increased production pays the entire cost of cleaning.

Then consider this—that you can clean felts right on the machine.

Many mills are now using Oakite for washing felts; rags for paper stock; cleaning Fourdrinier wires; grinding calender rolls; removing dirt, oil and tar from wire cylinders; cleaning dandy rolls, screen plates, pipes and mixers.

It will pay you, as it has so many others, to call in the nearest Oakite service man and find out what he can do for you. No obligation. Write for him to call, or for further information.

OAKITE

TRADE MARK REG. U. S. PAT. OFF.

Industrial Cleaning Materials and Methods

OAKITE IS MANUFACTURED BY OAKLEY CHEMICAL CO.
16A THAMES ST., NEW YORK, N.Y.

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ST. REGIS PAPER COMPANY

Daily Capacity 425 Tons

Newsprint, Catalog
Directory Papers
Butchers Manila
Packers Oiled Manila

General Sales Office

49 Wall Street, New York

Farmers' Bank Building, Pittsburgh, Pa.

Following the sudden death of Norman Lang, managing director of Powell River Co., in April, the board of directors of the company elected S. D. Brooks the executive vice-president, with headquarters in Vancouver, A. E. McMaster as general manager, and R. Bell Irving as mill manager at Powell River, and also made the announcement that there would be no change in policy under the new management.

Rapid progress is being made in the construction of the plant of the Canadian Scottish Paper Mills, Ltd., at New Westminister, and it is hoped to have it in operation in the course of a few weeks.

NEW BRUNSWICK

The McNulty interests of Bangor have acquired an option on a large tract of wooded lands in St. John County. The Bangor parties have been endeavoring for some time to buy timberlands in New Brunswick. The option was for two months, and present indications are that it will culminate in the sale. There is no definite information regarding the price involved, but it is reported as in excess of $160,000. The present owner of the property is the Prescott Lumber Co.

Engineers of the Fraser Companies have arrived at Campbellton for the purpose of commencing preliminary work in connection with the new newsprint mill to be erected there in connection with the Grand Falls development scheme. Negotiations have been under way for the purchase of power from the town and the Lower St. Lawrence Power Co., in order to place the projected mill in operation prior to the date upon which power will be available from Grand Falls.

NOVA SCOTIA

Barnjum Offers Prizes for Forest Protection

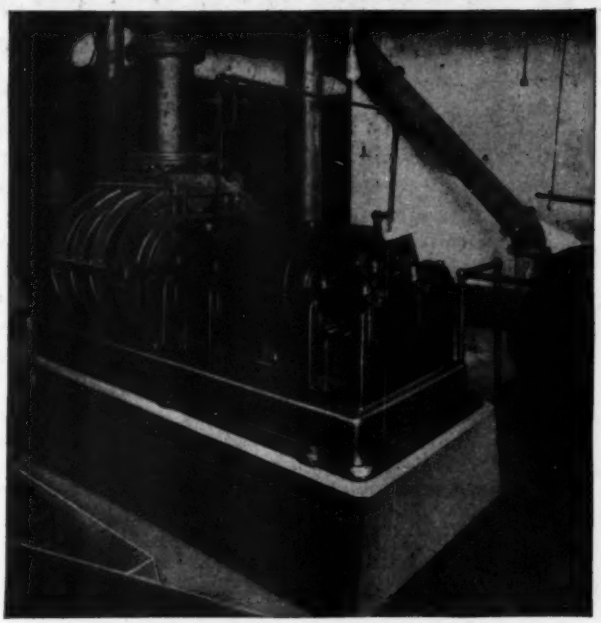
To demonstrate in a practical way his appreciation of the services of the Chief Forest Rangers of Nova Scotia, Frank J. D. Barnjum is offering $1,000 in prizes to be distributed among the three Chief Rangers who make the best showing in fire prevention for the season of 1926.

First prize will be $500, second prize $350 and third prize $150, the judge to be the Chief Forester of the Province, and the prizes to be paid on the first day of November, 1926. In deciding upon the awarding of the prizes the fewness in number and small area of fires that have occurred in the districts will play an important part.

In making the announcement Mr. Barnjum stated that he hoped that the first prize would be awarded to a Chief Ranger who could show a clean slate in regard to forest fires in his district; but organization of the sub-rangers patrol, technical reports, and general conduct of the service would also be taken into consideration.

J. R. Gordon, who has been manager of the MacLeod Pulp and Paper Company since 1919, is leaving to take a post of greater opportunity with a large American organization, and on the occasion of his departure the employees of the company, and others, held a smoker in his honor. J. A. Parker is taking over the managership.

It is understood that the A. P. W. Paper Co. are planning extensive development at their Sheet Harbor plant, and that the Nova Scotia Power Commission, from whom the A. P. W. Paper Co. are now taking 28,000,000 kw. hrs. per year, will start work on the construction of two additional power dams on the Sheet Harbor power development to provide for increased demands from the pulp mill.



ROOTS

Rotary Pumps

Where dependability counts—that's where you'll find Roots Rotary Pumps. They're not the cheapest to *buy*, but they're the most economical to use—economical in power consumption, in maintenance cost, and because you *know* they'll be right on the job when you need them most.

For vacuum service or for handling liquids and stock, you can't buy better. Ask for a bulletin covering pumps for your particular service.

The P.H.&F.M. ROOTS CO.
DEPT. 10
CONNERSVILLE, IND.
Chicago Office 130 S. Michigan Ave.
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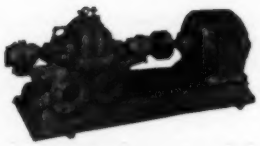
Centrifugal Pumps

EFFICIENCY, adaptability, sturdiness, ease of maintenance and low cost of operation are five inherent features of "Chicago" Centrifugal Pumps and are five good reasons why they are essential to increased efficiency in your mill. A quarter of a century of constant study and exhaustive tests have enabled us to embody all five of these characteristics in one product, a feat of which our Engineering and Designing Departments are justly proud.

"Chicago" Pumps are designed to handle any kind of liquid or semiliquid in heads and capacities to suit the job. Do you want our Engineer to call upon you to show you the relation of dependable pumps to your mill efficiency, or shall we send a catalog? Just write—

Chicago Pump Company
2318 Wolfram Street **Chicago, Ill.**



The Type "D" Single Stage, Double Suction, Horizontally Split Shell Pump is designed for capacities up to 1800 GPM and heads up to 215 feet. Its construction is rugged and substantial—its operation is quiet and free from vibration. Wearing parts are easily accessible, making any necessary repairs a simple job. The "D" pump is ideal for hard work. Bulletin 101 fully describes this splendid outfit.

Sewage *Circulating*
Vacuum *Condensation*
Sump *Fire*

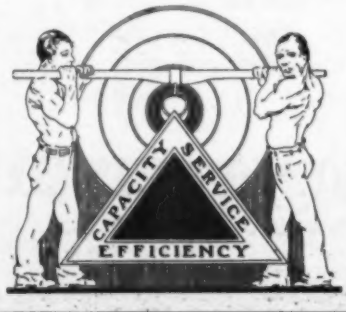
Chicago Pump Company

DRY PAPER EFFICIENTLY
The Fulton Dryer Drainage System

—Increased production
—Decreased steam pressure on the dryers
—Reduced steam cost for drying

Better Sheet—Better Finish—Less Shrinkage

—and cockling prevented by drying with graduated temperature — Less pressure or vacuum on paper machine dryers.



We will gladly refer you to mills using the Fulton System and making the same grade of paper as you. They will tell you their experience with the Fulton System.

U. S. Patents Dec. 10, 1919, and June 7, 1921. Canadian Patents July 6, 1920, also patents pending.

Fulton Engineering Co.
MIDDLETOWN, OHIO

The Beveridge Supply Co., Ltd., 628 St. Paul St. W., Montreal, Canadian Representatives

NORTHERN NEW YORK NEWS

Gould Mill Burns

The Shuetown mill of the Gould Paper Company, located about four miles from Lyons Falls, where the main plant of the company is, was totally destroyed by fire on the morning of May 8th. The loss is about $100,000. The paper mill was the only industry of the little hamlet and it is not known whether it will be rebuilt.

The first paper mill to occupy the site was built in the early seventies by the late Ward Hearst and John Moyer. The mill, which was of the old cylinder type, was burned about ten years later. In 1883 it was rebuilt and was taken over by Shue and Appel and it was from the older member of the firm that the little hamlet got its name. About 24 years ago it was purchased by the Gould Paper Company for $75,000 and a number of improvements were made. Last fall new engines were installed at a cost of $4,000. The paper mill had one 86-inch machine and a daily capacity of seven tons. The wood mill had a capacity of five tons a day. For the past two years newsprint had been made with an occasional run of government manila. Twenty-six men were employed in the mill. Charles E. Cook was superintendent of the mill.

Fire in Mohican Mill

Fire destroyed the Mohican pulp mills building at Middle Falls on the morning of May 11. Loss is estimated at $20,000.

The one-story frame structure has been idle since the building and power rights were sold to the Consolidated Electric Company two years ago. The latter was absorbed by the Adirondack Power & Light Corporation. Origin of the fire is undetermined.

Ed. Wright Takes New Duties

Edward Wright, on June 1, assumed the duties of vice president and general manager of the Malone Light & Power Company. For the last nine years, Mr. Wright has had charge of all the paper and pulp mills of the New York World Corporation, both in the United States and Canada, including the High Falls Pulp and Paper Company at Chateaugay, which town has been his headquarters for several years. Mr. Wright has had the superintendency of construction of extensive mills and dams for the World corporation and is widely known as a construction expert. He will have charge of the new Titusville storage reservoir of the Malone Light & Power company.

Major Harry C. Wilder, son of Mark S. Wilder, for several years president of the Diana Paper Company, was the predecessor to Mr. Wright. Mr. Wilder goes with the Carlisle organization as the head of the sales department of the Northeastern Power Corporation, of which the Malone Light & Power company is an integral part.

DeGrasse Breaks Production Records

For the week ending at 7 a. m., May 2, the DeGrasse Paper company at Pyrities broke all previous production records. The daily high record was April 29, when 191.67 tons were produced. The total weekly production was 1,113.36 tons, an average of 185.56 for the six days.

During the month of April, 4,744.29 tons were made which exceeds all previous monthly records, the daily average for the month being 182.47 tons. During the week four felts, one dryer canvas and one jacket were put on the machines.

The Ontario Specialties Company with office in Albany and plant in Watertown, has been awarded the contract for 420,000,000 facing slips to be used by the Postoffice Department to label mail sacks. The Ontario company offered to supply the contract at the rate of $40.50 per million.

Facing slips are of cheap manila or newsprint, three by five inches. The 420,000,000 asked for is expected to supply the Postoffice Department for about six months. The department asked bids on two kinds of paper in two grades, 28-pound

Bring us your Pulp and Paper Mill Pressure Problems

THE Mason Regulator Company maintains a staff of pressure control specialists to help you obtain maximum efficiency from every pressure regulator installation.

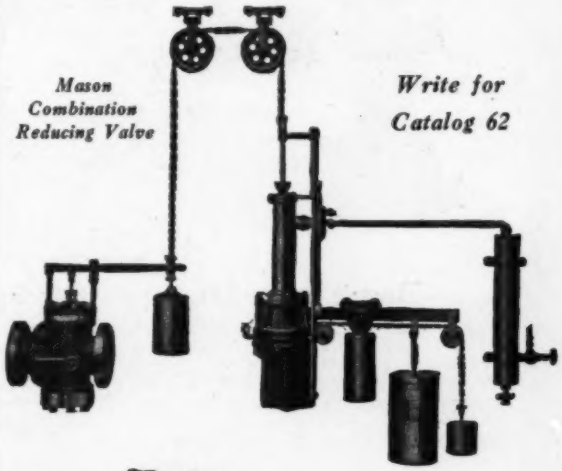
For over forty years this company has centered its entire efforts upon the production of accurate and dependable Mason Regulators which may be had for every type of pressure service.

The Mason Combination Reducing Valve is specially designed to maintain constant reduced pressure in systems where the initial pressures are widely fluctuating. It is particularly recommended for controlling steam to digesters and paper machines.

Perhaps we can be of service to you in working out your pressure regulation problems to your best advantage.

Mason Combination Reducing Valve

Write for Catalog 62



Mason Regulators

MASON REGULATOR CO.
Boston, Mass.

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FOR ECONOMICAL PRODUCTION

Write for Prices and Specifications

Centrifugal Half Stuff Pump

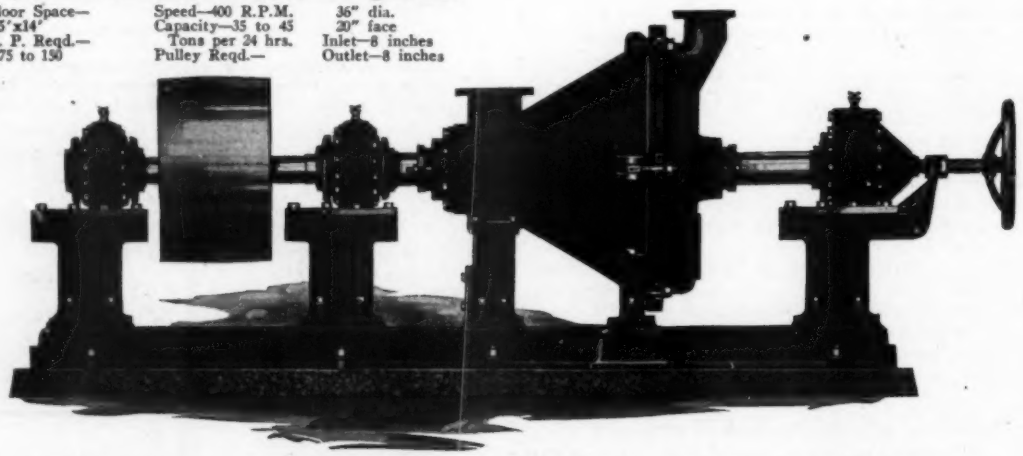
Our pump has many advantages over the ordinary HALF STUFF PUMP. It is designed for use on long, coarse stock; has large openings (ranging from 3" to 10" in diameter); does not clog; will throw out anything that will go through the pipes; will deliver stock at any angle.

Our pumps are in use transferring half stuff from one chest to another and feeding Claflin refiners, jordans and wet machines.

Built in bronze, cast iron and lead.

CLAFLIN REFINER—No. 2—Largest size

Floor Space—5'x14'
H. P. Reqd.—75 to 150
Speed—400 R.P.M.
Capacity—35 to 45 Tons per 24 hrs.
Pulley Reqd.—36" dia. 20" face
Inlet—8 inches
Outlet—8 inches



Direct from Digesters to Paper Machines — the Claflin Way

Profit depends upon production cost and production cost is proportionate to the number of operations necessary to produce a given quantity. The Claflin Way takes the pulp from the digesters direct to the paper machines, eliminating any need of tub-beaters or Jordans. This means less power consumed, less investment in machines, less labor, less time, and low minimum of repairs. Claflins are easier to operate, wear longer and work better. If, however, they are used with tub-beaters, they shorten the time from 25% to 50%. For bigger, better and infinitely more profitable production—Claflinize.

Write for Catalogue.

Complete description on page 358 Paper & Pulp Mill Catalogue

HERMANN MANUFACTURING CO.

LANCASTER, OHIO

WATEROUS ENGINE WORKS CO., Ltd., Brantford, Can., Licensed Mfrs.

and 32-pound manila and 28-pound and 32-pound newsprint. The contract calls for bundling the slips in packages of 3,000 and shipping in carloads of 30,000,000 slips, f. o. b. plant. Shipments are made to all parts of the country and as most of the slips are used in the East, eastern bidders are given preference. The Ontario Specialties company already has the contract for facing slips which expires July 1.

The Algonquin Paper Corporation of Ogdensburg has made application to the common council to have the harbor lines extended. The purpose is to enable the Algonquin to make a fill so as to provide larger space for the storage of pulpwood, the area to be reclaimed being one and a half acres. If the Ogdensburg council approves, permission must be obtained from the United States district engineer's office.

The Phoenix Paper Company, of Battenville, filed a petition in voluntary in Federal Court at Utica, May 13, with liabilities of $349,970 and assets of $325,816, including real estate and machinery. The board of directors authorized the president, S. A. H. Wilcox, to sign the petition.

Carthage Plant Producing

The big machine of the Carthage Pulp and Board Company was started May 20, after a little over four months of preparation. The Carthage Paper Board Company is the name of the incorporated holding company organized by the bondholders to take the title of the property formerly owned by the Carthage Sulphite Pulp and Paper Company. The name of the company was recently changed to the Carthage Pulp and Board Company.

Seventy men were employed remodeling the mill. Fifteen dryers have been added to the machine and the driving train has been changed so as to speed the machine up 100 feet per minute more than heretofore. Reinforced concrete floors have been put in. New Jordans and pumps have been installed in addition to five Bird rotary screens. The paper machine has been piped with headers placed below the machine room floor. The stock chests have been moved from their former place into a room by themselves and a new power plant installed, which consists of a 750 k. w. General Electric tub generator equipped with a LeBlanc condenser. The new power equipment will be used to furnish power in case of an emergency. There are four 500 h. p. boilers in the main power plant. A new roof has been put over what was the sulphite mill which was burned some time ago. This part of the building will be used for storage and it is large enough for 80 cars of raw material. This building is being equipped with an electric monorail system. An additional railroad siding has been built.

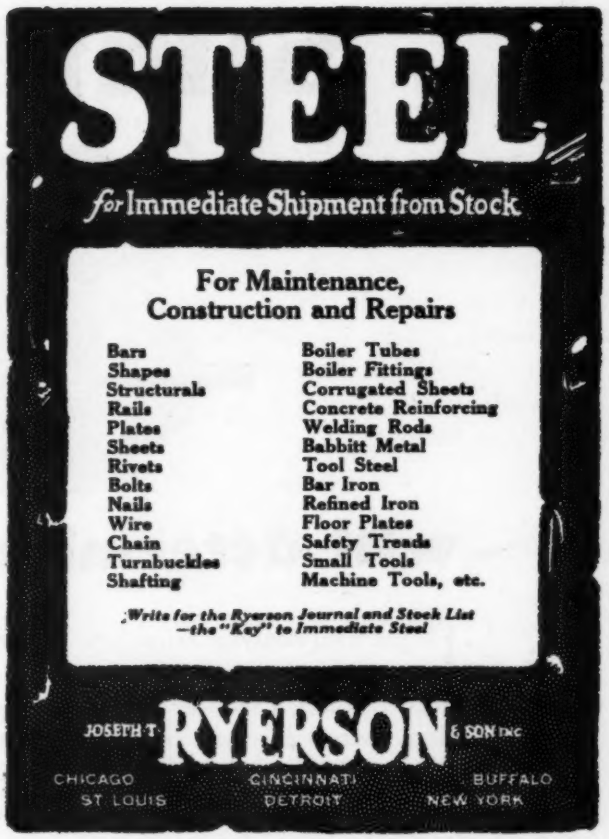
Work on the smaller machine has been started and it will be completed within six weeks. More cylinders will be added which will enable the machine to produce a better grade of paper. The combined capacity of the two machines will be 85 tons of paper a day.

Stroud and Company, Philadelphia bankers, underwrote the bonds of the Carthage Sulphite Pulp and Paper Company. The new organization is largely made up of Philadelphia interests. The officers of the company are: President, Homer Reed, Jr.; vice president and general manager, John R. Draper; secretary, Maurice Fisher; general superintendent, James Quinn.

The Smith-Lewis Fibre Corporation of Lowville, the recently organized company which took over the Beaverland factory, and which installed thousands of dollars' worth of valuable machinery for the manufacture of fibre products, began operation the week of May 10th. About 50 persons will be employed when the plant is running to full capacity.

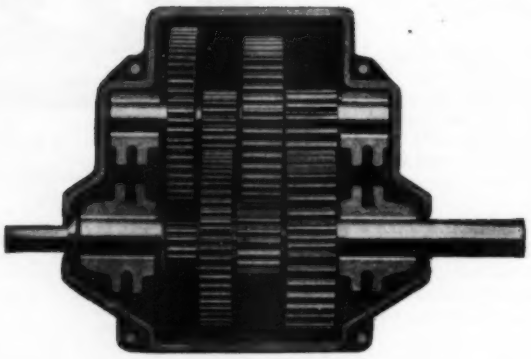
Sales Campaign Planned by Union

The Unity Mills, of Potsdam, will undoubtedly profit through increased output as the result of the wage and working agreement just signed with the Brotherhood of Paper Makers. The union controls the sale and regulates the price of union label watermarked paper, and it is now planning to stage an ag-



Approved for Paper Mill Service
Stanley
Solid Woven Cotton Belting
Recommended Especially for
Jordans, Beaters, Winding Rolls
ALKALI: VAPORS: WATER: Vapors, heavy humidity, contact with alkalis and water have no effect on working ability.
HEAT: Extreme heat and dryness for years have no noticeable effect.
OIL: No deterioration even after years.
STRETCH: SLIP: Very tight woven, flexible. All stretch comes out in first day or two. Minimum slip.
STORAGE: Withstands indefinite storage.
JOINED: Any standard metal fastener.
Place this data so you will turn it up when next buying belting.
Stanley Belting Corporation
320 Broadway New York
124 Adelaide St., W. Toronto, Ont.
17 N. Jefferson St., Chicago
42A Southwark St., S. E. 1. London, England
STANLEY BELTING
MADE IN SCOTLAND

Simplicity



will determine your choice

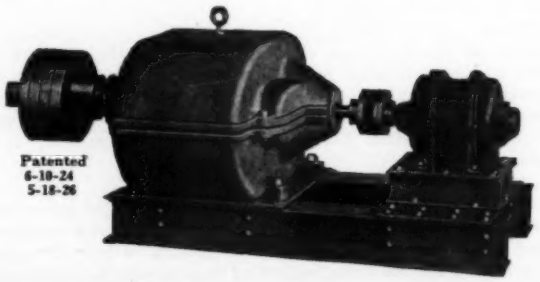
IN the final analysis, when you've summed up all other factors, the **simple** speed reducer is the one most likely to be your choice. Because, whatever good features a reducer may have, unless it is free from complications in design, there's a strong probability that it will get out of adjustment, tie up production—and thus nullify all its "strong points."

Simplicity is the dominant characteristic of the Palmer-Bee Reducer. There are no gyrating planetary pinions, internal gears, diaphragms, floating discs or overhung studs. Nothing to get out of order. Just a train of sturdy, wide-face, coarse-pitch gears, mounted on heavy thru shafts, supported in bearings of large area at both ends. An extremely simple unit, of ample strength, and guaranteed efficiency. Bulletin 445 tells all about it.

PALMER-BEE COMPANY
Detroit, Michigan

"World's Largest Producers Use P-B Reducers"

"The entire mechanism is carried in the lower half of the housing with an easily removable cover."



Patented
6-10-24
5-18-26

Palmer-Bee Speed Reducers

TRADE MILL REG. U.S. P-B MARK TYPE PAT. OFFICE.

gressive campaign throughout the country to bring about a larger usage of this paper. A large percentage of the paper is made by the Unity Mills.

The importance of the adjusted wage scale of the paper makers was emphasized by President W. R. Smith of the International Brotherhood, who says that the paper makers will gain approximately $500,000 more in wages during the next 12 months. The payroll of one company alone, Mr. Burns says, was increased $15,000.

Reforestation in Northern New York

Never in the history of Northern New York has there been as much reforestation as during the present spring. Millions of trees have been planted in the several counties of this section and a remarkable amount of educational work has been completed which insures a continuation of this work in the future.

The state is undertaking a large reforestation program in the Boreas river section of Essex county. This land was originally a fine spruce forest, but it was heavily cut and was later burned over in 1903, since which it has been waste land. Sixty planting crews are engaged in planting 100,000 Norway seedlings and in all 2,000,000 trees will be planted on this tract alone.

The Boy Scouts of Slingerlands have been won over to the cause of conservation and have this spring set out 5,000 blue spruce and 5,000 Scotch pine. The students of the Gouverneur High School celebrated Arbor day by setting out 4,000 red and white pine trees in the Black Lake section. School was dismissed for the day and after the trees had been planted a sports program was enjoyed. At Castleton Boy Scouts and others planted 5,000 pine seedlings on the site of the village reservoir. At Cobleskill, Charles G. DuMond planted 3,000 pine trees on his farm. Mr. DuMond is an enthusiastic forester and in the last ten years he has completely reforested 130 acres of his property. Schoharie county has undertaken a comprehensive program of reforestation and hundreds of acres of idle land are being planted to trees.

In Carthage, Water Commissioner C. W. Wilson has secured 100,000 white pine seedlings which will be set out on the site of the Carthage reservoir. The trees were secured from the Lowville nursery. The village started reforestation work on the site of its reservoir in 1911. Trees have been set out each year and the village now owns a forest of several hundred thousand trees which are constantly increasing in value.

The Malone Water department set out 20,000 white pines on the site of its reservoir. The Glens Falls water department set out 50,000 white pines as the first of the million trees which are to be set out. The Glens Falls water department has set out 1,200,000 trees since the municipal forest started 16 years ago. Some of the trees are 15 to 20 feet high. Other shipments from the Saratoga state nursery include 30,000 white pines to Corinth, 15,000 to Meckanicsville, 11,000 to a privately owned nursery. Foreman Truman Lewis of the nursery, says that 17,000,000 trees will be sent from the nursery this season to every part of New York state.

The St. Regis Paper Company is setting out new trees at the rate of 1,500,000 each year from its own nursery at St. Regis Falls. It plans to set out 3,000,000 in 1927 and 4,000,000 in 1928. It plans to increase the planting until there is an annual planting of 10,000,000 trees.

Records of Arctic Expedition on Permanent Paper

The history-making accomplishment of Lieutenant-Commander Richard E. Byrd, United States Navy, in flying to the North Pole is of particular interest to the paper industry because of the precautions taken by the Government expedition to insure the durability and permanence of the party's maps and records.

Officials in charge of the expedition realized that the charts and other documents would have to stand the most trying use. They also recognized that the international importance of the records required that they be on paper of the utmost endurance and permanence.

To the L. L. Brown Paper Co., Adams, Mass., went the honor of supplying the record and map paper for the Byrd expedition. Lieutenant-Commander Byrd personally selected Brown's Linen Ledger, Substance 36, for his maps and records.

Watson, Frye Company
BATH, MAINE

Manufacturers of

Wood Pulp Grinders with 3 and 4 pockets. All Sizes.

Wet Machines, Deckers, also Combination, Wet Machines and Deckers.

Diaphragm Screens, Six to Eighteen Plate, inclusive.

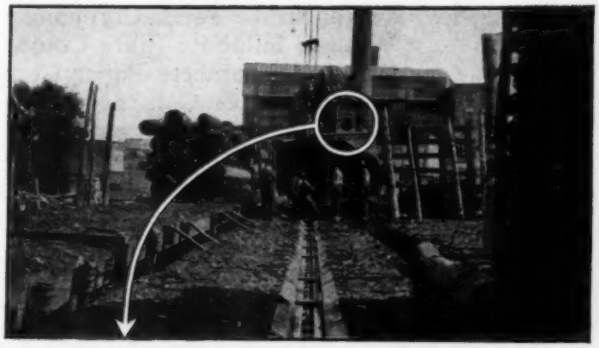
Also

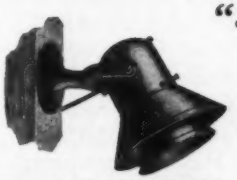
Union Wet Machines for Sulphite and Sulphate Pulp, 30 tons production Extra Dry.

Chippers, 48″, 84″, and 90″ with 3 and 4 knives.

Cylinder moulds all sizes.

Bronze and Lead Fittings, for sulphite mills, and also all kinds of Iron, Brass, Bronze, and Composition Castings.





Type "A" FEDERAL ELECTRIC SIREN . . $37.50 Complete

"Quick—there's a Jam"

That's the call of the Federal Electric Siren. When something goes wrong with the wood-handling machinery, your men must be on their toes. The Federal Electric Siren, properly placed, sends out its weird, penetrating cry for help. Your men recognize its call instantly. It saves their time for more important things. Pays for itself many times over. The Federal is always ready for service—oiling at long intervals, only attention it requires. The universal motor operates on all voltages from 6 to 250, or from storage battery. Mail coupon today for 30 days' free trial. Money back guarantee. Be sure to give voltage desired.

FEDERAL ELECTRIC COMPANY
8700 S. State St., Chicago, Ill. Date.....1926

Send Type "A" FEDERAL SIREN, $37.50 complete, for.....volts, and if not pleased with it I will return it prepaid for credit.

Company Name.....

Address.....City.....

My Name.....

Position.....(PI-5)

SHEAHAN PATENT PAPER CARRIER

Takes the Paper Automatically Through Dryers

PREVENTS ACCIDENTS - SAVES BROKE PAPER
IT NEVER MISSES AN END

No Slack Paper on Dryers

Passes the Paper at Exact Speed of Dryers

USED BY

International Paper Company	25	Machines
Paul A. Sorg Company	1	"
Abitibi Paper Company	6	"
Laurentide Paper Company	6	"
Frank Smith Paper Company	1	"
Wausau Sulphate Fibre Company	3	"
Crown Willamette Paper Company	16	"
Fitzdale Paper Company	2	"
St. Croix Paper Company	3	"
Crocker Burbank Company	3	"
New York & Pennsylvania Company	3	"
Kalamazoo Vegetable Parchment Company	1	"
Central Paper Company	1	"
Algonquin Paper Corporation	1	"
Great Northern Paper Company	2	"
Backus Brooks Company, Kenora	2	"
Fitchburg Paper Company	1	"
Brown Company, Louisiana	1	"
Louisiana Paper Company	2	"
Fort William Paper Company	2	"
Filer Paper Company	1	"
St. Regis Paper Company	1	"
St. Maurice Paper Company	4	"
Hawley Paper Company	3	"

And 100 Other Machines

THE BAGLEY AND SEWALL COMPANY

WATERTOWN, N. Y.

NEW YORK CITY NEWS

Millar Takes Over Holden & Hawley

One of the most important developments in the paper jobbing trade of New York City in a long time has just been announced whereby George W. Millar & Company, Inc., of 284 Lafayette street, have acquired a controlling interest in Holden & Hawley, Inc., of 196 West Broadway, New York. The new personnel of Holden & Hawley, Inc., will be William H. Holden, president; Fred W. Bascom, vice president; James F. Levens, vice president; J. C. Mallalieu, treasurer, and John J. Dillon, secretary.

George W. Millar & Company, Inc., is one of the oldest paper houses in the country, and until recent years confined its activities to the coarse paper field. Mr. Mallalieu, it will be recalled, became president of the firm in April, 1919, when he resigned from Charles F. Hubbs & Company, of New York, after about 27 years of service with that concern, and at which time he, with Messrs. Bascom, Levens and Dillon, acquired a controlling interest in George W. Millar & Company, Inc. Mr. Mallalieu was formerly president of the New York Paper Trade Association, and is at present vice president of the National Paper Trade Association in charge of the Wrapping Paper Division of that organization.

About three years ago George W. Millar & Company, Inc., decided to enlarge its business by entering the fine paper field, and the growth of this department of the company since has been so gratifying that it was deemed advisable to acquire Holden & Hawley, Inc., one of the foremost fine paper houses in the metropolitan area. The amalgamation brings together two concerns which have been pre-eminent in their respective fields. Holden & Hawley, Inc., will continue at 196 West Broadway in charge of Mr. Holden, who will have the advice and co-operation of Mr. Mallalieu and his associates.

Anderson Company Buys Building

F. W. Anderson & Company, Inc., one of the longest-established and best-known paper jobbing concerns in New York, has purchased the building which it occupies at 16-18 Beekman street, New York. The building, which is a six-story and basement and sub-basement structure, was at one time occupied by Henry Lindenmeyr & Sons, paper merchants, and is one of the finest buildings housing a paper concern in the metropolis. It is fireproof throughout, and is located only a few feet off Nassau street in the heart of the Beekman street paper center. The Anderson company occupies the two first floors and the two basements. Before moving into the building which it now owns, the Anderson firm and its predecessors was a tenant since 1860 at 34 Beekman street.

The firm originally was Bradley R. Hard & Company, which was followed by J. F. Anderson, Jr. Company, and about 20 years ago became F. W. Anderson & Company. In 1913 it was incorporated with F. W. Anderson as president, Randolph Nexsen as vice president and treasurer, and John A. Howe as secretary.

Employees of the United Paperboard Company, Inc., with mills scattered throughout the country and with principal offices at 171 Madison avenue, New York, have joined with the executives of the company in acquiring a group life insurance policy which provides for the protection of 765 lives for a total coverage of $1,502,500. The policy, issued by the Prudential Insurance Company, is of the contributory type, the employees paying a part of the premiums and the United Paperboard Company assuming the remainder of the cost. All workers earning more than $250 a month are protected for $5,000, those earning from $200 to $250 for $3,000, and those earning from $100 to $200 for $2,000.

Fred C. Strype, sole American representative for a number of European paper mills and specialist in technical and distinctive papers, both domestic and foreign, has moved from 320 Broadway to larger quarters in the Bradstreet Building at 140 Lafayette street, New York, where the entire eleventh

The Adaptability of Dayton High Speed Beaters to all sorts of conditions, in all sorts of mills, making all sorts of paper is well established.

In the 40 or more mills now using Daytons, are to be found practically all the beating problems likely to arise in paper making.

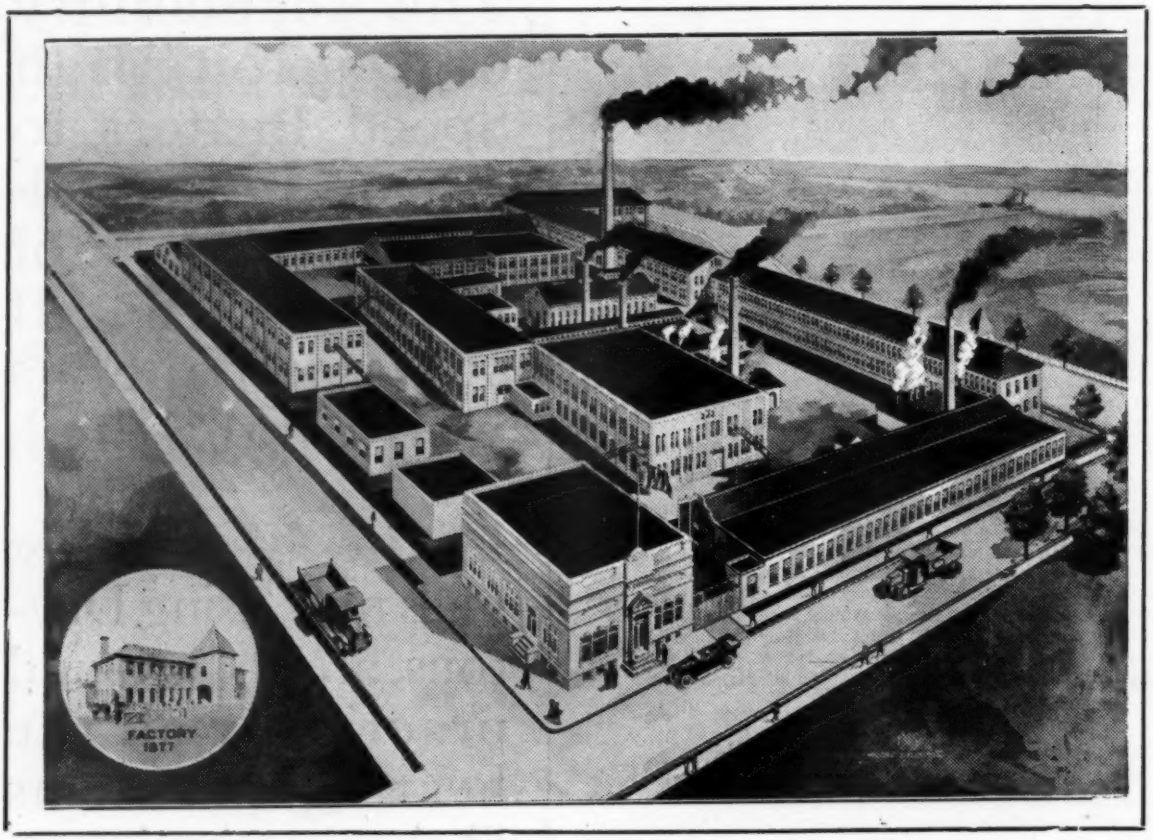
Superintendents in other plants should learn more about the Dayton High Speed Beater.

We Rest Our Case on Performance

D B & H

The Dayton Beater & Hoist Co.

Dayton, Ohio



This Illustration Visualizes Forty-six Years of Progressive Growth and Unsurpassed Achievements in the Production of

EASTWOOD

FOURDRINIER-CYLINDER-WASHER

WIRES

EASTWOOD WIRE MANUFACTURING CO., BELLEVILLE N.J. U.S.A.

floor is occupied. At the new address stock will be carried, thus allowing for better and quicker service to the firm's customers. The warehouse at 54 Washington street will be continued.

A petition in bankruptcy was filed on May 12 against the Interboro Paper and Twine Mills, Inc., of 23 Marcy avenue, Brooklyn, N. Y., by James Thompson & Company, Inc., for $252; James H. Wahlers for $1,015, and the Nostrand Lumber Company for $581. Judge Campbell later appointed George F. Picken receiver in bond of $2,500.

George F. Commerdinger, widely known in the paper trade in New York City, has resigned from the Whiting-Patterson Company, Inc., of 265 Canal street, to join the sales force of the Keith Products Company, Inc., of 417 Lafayette street, New York. Mr. Commerdinger has been identified with the trade for 20 years, and was one of the organizers of the New York branch of the Whiting-Patterson Company, Inc.

Sigmund Goldman, president of the English China Clay Sales Corporation, of 33 West Forty-second street, New York, sailed late in April for a six weeks' visit in England. This is Mr. Goldman's annual visit to the parent company, the English China Clays, Ltd., which produces half a million tons of clay yearly.

According to an announcement made by Treasurer Lawrence Beattie of the Robert Gair Company, whose main offices are in New York, part of the Gair Manufacturing operations now located in Brooklyn, N. Y., will be moved to Piermont, N. Y., in the near future. Mr. Beattie states that approximately one-third of the paperboard products manufacturing will be transferred from Brooklyn and housed in a new $400,000 building to be erected in Piermont. The move is prompted by a desire to economize. The company has a board mill in Piermont which it purchased in 1920, and the products manufacturing operations will be moved so as to be at the seat of the raw material. The factory in Brooklyn thus will be afforded more room for expansion of operations there.

Jonas L. Girth, of the Amecousema American Trading House, 25 Rue St. Augustin, Paris, France, dealers in European fine papers and paper stock, is expected to arrive in New York late in May on a business trip to this country, and can be reached until June 15 at 23 West 184th street, New York.

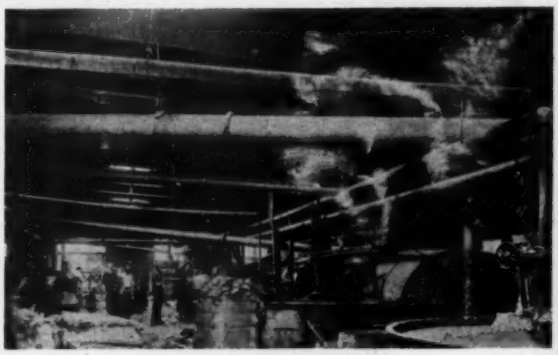
The J. E. Linde Paper Company, of 90 Beekman street, New York, which hitherto carried only a few lines of the A. M. Collins Manufacturing Company, is now stocking the entire line of that mill.

Several prominent paper manufacturers, including George W. Sisson, jr., Racquette River Paper Company; Grellet Collins, Dill & Collins Company; E. H. Burton, A. P. W. Paper Company; Martin Cantine, Martine Company, and others, were in New York May 20 for attendance at the annual meeting and dinner of the National Industrial Conference Board.

Major and Mrs. Warren B. Bullock, and their daughter, Catherine, sailed on the S.S. Thuringia for Hamburg, Germany, May 20. Major Bullock will spend six weeks in Germany and the Scandinavian countries.

R. H. Laftman, of the Bogalusa Paper Company, Bogalusa, La., sailed from New York late in May.

Col. Philip K. Fletcher, of the Fletcher Paper Company, Alpena, Mich., has been designated by Norman W. Wilson, president of the American Paper and Pulp Association, to represent the paper industry in connection with the co-operation between the War Department and the industries of the country in plans being worked out by Col. H. Macnider, the assistant secretary of war, for peace time mobilization of material and industrial organizations under the National Defense Act. Colonel Fletcher received his commission as captain at the close of the First Officers' Training Camp at Fort



Overhead Lines in paper plant

Overhead Pipe Lines

SUCCESSFUL overhead pipe lines have been made possible with "Michigan" Combination Steel and Wood Pipe. A special steel flange fitting eliminates the ordinary leaks and troubles.

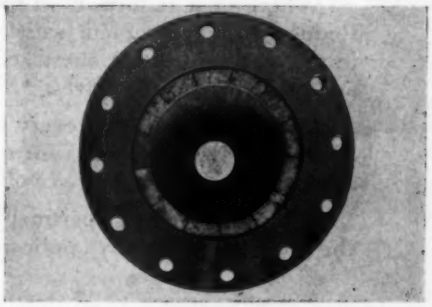
This flange fits over the tenon of the pipe and is used simply as a connection. No metal is exposed to the liquid, which keeps it free from specks of rust to harm the paper.

"Michigan" Combination Steel and Wood Pipe is made of seasoned wood, reinforced with spirally wound steel bands. The steel exterior is protected by two coats of asphaltum, applied hot. There is no chance for corrosion or bursting under pressure.

"Michigan" pipe is stronger, more durable, and has 20% greater carrying capacity than iron pipe.

The number of paper mills using "Michigan" pipe is increasing daily. It is found best for conveying white water, sulphite, ground wood and pure water.

Send us your blueprints and we will gladly furnish estimates on pipe and fittings to suit your requirements.

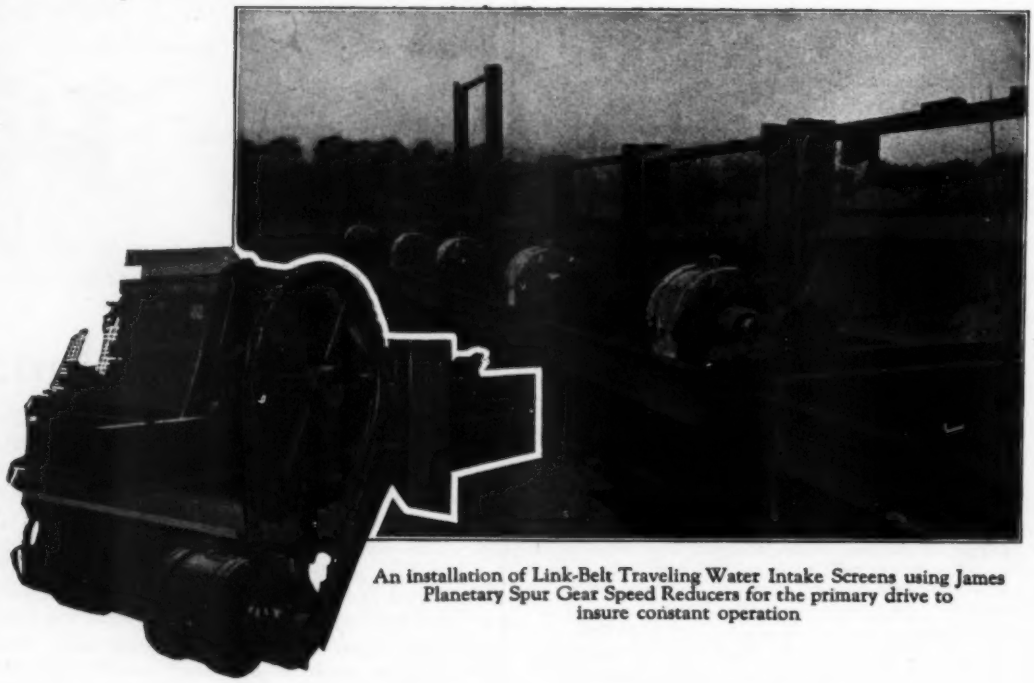


End view of Special Flange Coupling. Note metal outside

Tell us about your piping problem. If necessary, one of our engineers will gladly call and go over it with you. Remember, every piece of pipe and every bit of work is guaranteed.

MICHIGAN PIPE CO.

Dept. 17 BAY CITY, MICH.



An installation of Link-Belt Traveling Water Intake Screens using James Planetary Spur Gear Speed Reducers for the primary drive to insure constant operation

Clean Pulp is Essential

Clean water makes clean pulp. Water screens driven by James Reducers guarantee clean water and constant service.

Several manufacturers of equipment of this kind have standardized on James Reducers.

Wherever a reduction in speed is necessary, James Reducers give complete satisfaction. Thousands are in use on pumps, stock chests, conveyors, wet machines and other paper mill drives.

Made in types to suit every requirement—Planetary Spur Gear, Herringbone, Worm Gear, etc.—and in any ratio, they are a guarantee of efficient operation.

Our Engineering Department will help you to select the proper type for any application.

Send for Catalog No. 99

D. O. JAMES MANUFACTURING COMPANY
1114 West Monroe Street, Chicago, Illinois

D.O.JAMES

Sheridan, Ill., and made an excellent record as instructor during the Second Officers' Training Camp at the same station. He served throughout the war in the Infantry and Motor Transport Service, and is now colonel in the U. S. Army Reserve Corps.

J. P. Hummel, of the Hummel-Ross Corporation, Hopewell, Va., sailed from New York on Tuesday, May 18, for two months in central and northern Europe. Mr. Hummel was accompanied by Mrs. Hummel. It is their plan to join Major and Mrs. O. M. Porter, of the American Paper and Pulp Association, at Oslo, Norway, on May 30, and Mr. Hummel and Major Porter will visit a number of pulp and paper mills through Norway, Sweden and Finland.

Early Trade Associations

At the May meeting of the New York division of the Salesmen's Association of the Paper Industry, O. B. Towne, commissioner of the Asbestos Brake Lining Association, gave a very interesting talk on trade associations. Mr. Towne is a lecturer at New York University, and he has done considerable research in his particular field. He traced the trade associations back to the Babylonian era and showed how the Hanseatic League and the Guilds of England were none other than trade associations as we know them today, except that they were far more organized and had greater ramifications.

BRITISH CORRESPONDENCE

Wrapping Paper Duty

Just prior to the passing through Parliament of the 1926 budget, Messrs. Cadbury Bros., Ltd., the leading firm of chocolate manufacturers in this country, circulated among all members of Parliament a letter referring to the proposed duty on packing and wrapping papers under the Safeguarding of Industries, and quoted a paragraph of the Committee's report, in which it is suggested that " . . . no manufactured article should be taxed on import in respect of dutiable paper contained in it, if the value of such paper is less than 15 per cent of the cost of the completed article."

The letter explains that "this would mean that all wrapped chocolate goods imported would be given a decided advantage over a similar home-produced article, for if the duty were imposed we should have to pay 16⅔ per cent on our imported paper, because it would come in in bulk, and to the extent of 16⅔ per cent duty imposed we should be handicapped; and every manufacturing confectioner in the country would be similarly handicapped. In fact, to use the wording of the report, our industry would be heavily penalized in our home market, and doubly so in our export market, if this is not adjusted."

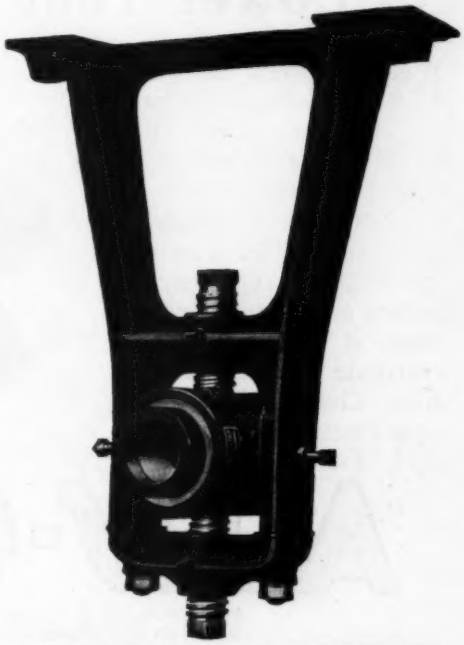
Modern Development of Paper Mill Plant

Last month a lecture was given before the Institution of Mechanical Engineers in London, by Mr. W. Worby Beaumont and Mr. Leslie N. Burt, on this subject. It was pointed out that good paper was being produced in England as far back as 1496, at a paper-mill at Hertford, owned by John Tate, and the history of paper production in this country from that date until the present time was briefly traced.

The lecturers stated there was no branch of paper-mill development in which more noteworthy advance had been made in recent years than that relating to motive power and steam uses, and yet in which, notwithstanding this advance, so much remains to be done in directions which have been adumbrated by recent steam-user experience.

At the recent annual meeting of the Board of Directors of the La Motte Chemical Products Co., Baltimore, Md., the following officers were elected: President, W. A. Taylor; vice-president and treasurer, F. W. Burr; secretary and assistant treasurer, Miriam Welch.

Where
Durability and Economy
Combine



WOOD FAFNIR

DURABILITY and economy that are continuous can now be had by installing power transmission machinery equipped with the new WOOD-FAFNIR Ball Bearing Hanger Boxes, Pillow Blocks and Post Boxes, Ball Bearing Loose Pulleys and Ball Bearing Equipped Friction Clutches.

Here is the ideal combination—life-long sturdiness and dependability of the Universal Giant Line of Power Transmission Machinery with the smooth running, power-saving Fafnir Ball Bearing.

There are sixty-nine years of experience in the manufacture of power transmission machinery behind the new WOOD-FAFNIR Products. Associated with it is an Engineering Service which will help you solve your power transmission problems.

There is a dealer near you who carries these new WOOD-FAFNIR Products in stock. He's a good man to do business with, and he'll be glad to tell you of the many advantages of the time, money and labor saving U. G. Line.

T. B. Wood Sons Co.
Chambersburg, Pa.

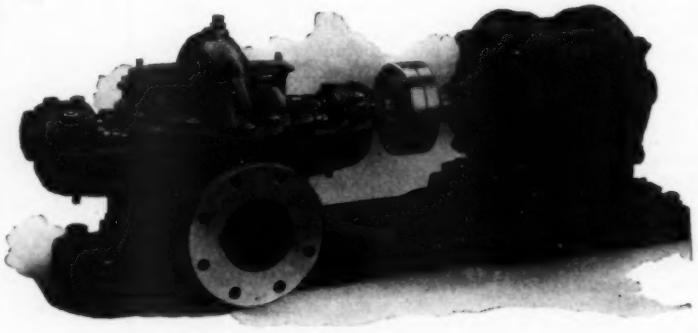
NEW ENGLAND BRANCH: Cambridge, Mass.
SOUTHERN BRANCH: Greenville, S.C.

Makers of Power Transmission Machinery Since 1857

Shafting, Hangers, Pulleys, Flexible Couplings, Friction Clutches and the U.G. Short Center Belt Contactor.

ECONOMICAL PUMPING
Will Lower Your Pumping Costs

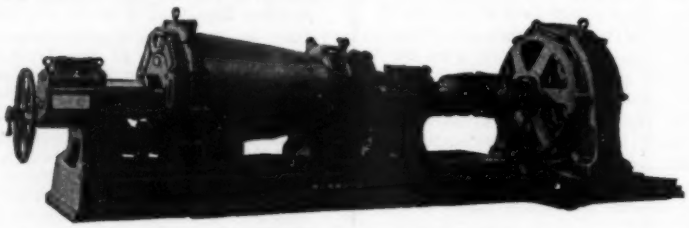
MANY tons of water are pumped for each ton of paper made. Allis-Chalmers' improved high efficiency pumps will reduce the cost of supplying this water. If you are figuring on replacing or adding any pumping equipment it will pay to investigate the economy of Allis-Chalmers' Centrifugal Pumping Units.



ALLIS-CHALMERS
MILWAUKEE, WIS. U. S. A.

A JORDAN ENGINE *for* EVERY PURPOSE

Direct Connected Motor Driven Jordans



Six Sizes:—
Baby Jordan
Pony Monarch
Monarch
Mammoth, Jr.
Mammoth
Bull Dog

DURING the past two years, over 80% of our Jordan output has been of the Direct Connected type.

Our Type "D" Jordans are particularly adapted to direct motor drive because of their sturdy construction and the design of our couplings and motor bases permits ample adjustment to insure full wear of Jordan plug and shell knives.

Paper Mill Engineers recognize more fully each day the advantages of Direct Connected units. Greater production and a finer quality of stock can be obtained and, because the speed of a motor is inherently uniform, a maximum quantity of a given grade of stock can be produced. Then, too, through the use of meters, the finishing point of the stock can be accurately indicated and the degree of contact of the Jordan knives can be determined more readily than when the "feel" of the operator alone is relied upon. Because belt pull is eliminated, the undue wear on bearings and eccentric position of the plug, so often found in Belt Driven units, is avoided.

Specifications and Prices Furnished on Request

THE NOBLE & WOOD MACHINE CO. **Hoosick Falls, N. Y.**

For list of our entire products, see page 387 in the 1925 Paper and Pulp Mill Catalogue

MICHIGAN NEWS

Charles Redmond and Father Die in Same Week

Charles Redmond, 55, one of the well known Redmonds of Kalamazoo, died Monday morning, May 17th, and Patrick Redmond, the father, died Friday evening, May 21st, at his home on Cork Street.

Patrick Redmond was a native of Kildare, Ireland, and came to this country when 9 years of age. He came to Kalamazoo in 1865, and when the Kalamazoo Paper Company was organized, took a position with that concern, working up to the position of head beaterman. The majority of his sons followed in his footsteps, and now Michael is general superintendent of the Kalamazoo Paper Company, having been made superintendent with that concern in 1896, and his brother, William, is also a superintendent at the same concern. Con Redmond was also superintendent at the Kalamazoo Paper Co. till he resigned to go to California several years ago.

Charles Redmond was born in 1871 in Kalamazoo and had resided here all of his life with the exception of a few years spent in Thorold, Ontario. He was a millwright and had been connected with the Kalamazoo Paper Company for a great number of years.

Wesel Hrk, 36, employed at the Western Paper Makers Chemical Company, was painfully injured Thursday afternoon, May 20th. He was engaged in welding an empty steel barrel with an acetylene torch, when the head was blown from the steel container, cutting him about the face and head.

Henry McNeilly, an employee of the Allied Paper Mills, King Division, was taken to Old Borgess Hospital on May 1st, suffering from injuries received when a cutter belt broke and struck him in the face. His injuries are not considered fatal.

Kalamazoo Parafine Co. Completely Gutted

An explosion which followed the cracking of a wax still, caused a fire on May 26th, which reduced the Kalamazoo Parafine Company's plant to wreckage and wiped out eight vats, representing a total of 400,000 pounds of wax.

The Kalamazoo Parafine Company was organized about six months ago by L. W. and Fred Sutherland, of the Sutherland Paper Company. L. W. Sutherland estimates the damage at $20,000, which is covered by insurance.

The Cecil R. Lambert Co., Inc., of Detroit, Mich., specialists in the design, manufacture and installation of conveying and handling equipment, has changed the name of the company to the Mechanical Handling Systems, Inc.

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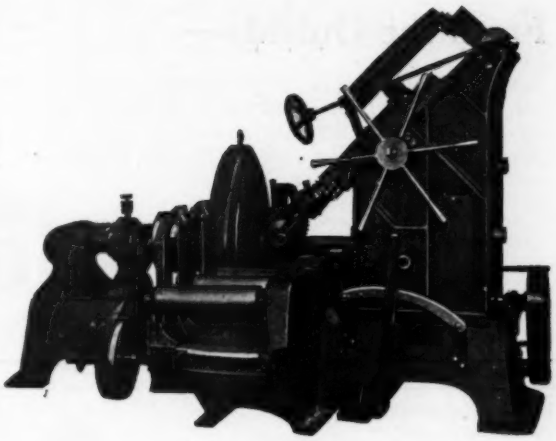
750 More Miles of Cable During 1926

The 1926 construction plan of the American Telephone and Telegraph Co. calls for 750 miles of cable and equipment to be laid during this year. This is by far the largest item on the program, calling for approximately 40 per cent of the $28,000,000 total involved.

Announcement is made that during the next four or five years, it is planned to install about 1,000 miles of cable a year, in addition to acquiring an interest in about 400 miles to be installed annually by various associated companies of the Bell System.

Several outstanding cable jobs for the present year are the Chicago-St. Louis route, sections of the New York-Buffalo-Cleveland route, and the Richmond-Petersburg section of the Washington-Atlanta route. In addition, plans now being made call for cable routes between St. Louis via Kansas City to Dallas, Texas, and from Atlanta via Jacksonville and West Palm Beach to Miami, Florida.

On a number of the principal routes addition cables are either being installed or are planned for installation in the near future.



A New Barker

Built to cut down waste and increase production, this barker offers you these features:

Knives are adjustable
Ball bearing mounted cutting head
Eight knives
Minimum upkeep

The only knife barker with adjustable knife head features. Built heavy, rigid. Capacity 2 inch to 12 inch diameter—wood in 2 or 4-foot lengths—18 to 20 cords per day (10 hours). *Produces clean wood with a minimum waste.*

This new barker is a piece of equipment every pulp mill needs for efficient production.

GREEN BAY BARKER CO.
Green Bay, Wis.

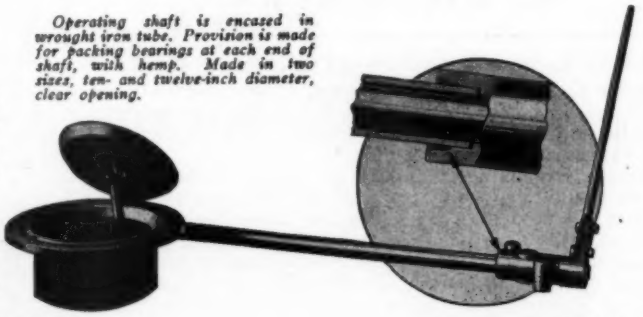
Makers of the famous Barker-International Pulp Screen

From the Outside—

No "fishing" and "poking" around the inside of the beater tub. This new dumping valve is constructed to operate from the outside of the tub. May be made either right or left hand by simply reversing two small bronze bushings.

Brass valve seat and lid are correctly proportioned. The valve in general is durable, easily operated and installed, and is positive in action.

Operating shaft is encased in wrought iron tube. Provision is made for packing bearings at each end of shaft, with hemp. Made in two sizes, ten- and twelve-inch diameter, clear opening.



DAYTON GLOBE IRON WORKS, **Dayton, Ohio**

Direct connected pump and motor of improved design and heavy construction for pumping pulp and thick stock. OPEN IMPELLER TYPE. HORIZONTAL SPLIT CASING. Interior surfaces machine finished. All bearings are removable from shaft without taking off any other part.

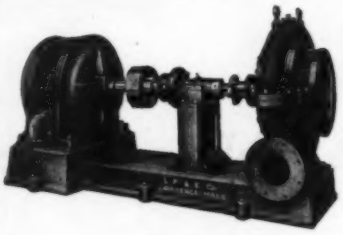


Fig. 67

We build Centrifugal Pumps exclusively—for all requirements

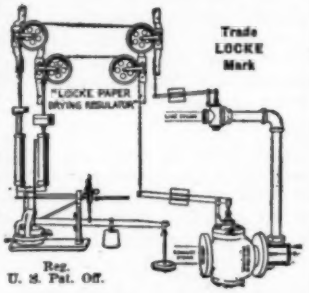
Write for Catalog 5 B

LAWRENCE PUMP & ENGINE CO.

P. O. Box 708 Lawrence, Mass.

LOCKE Paper Drying Regulator

This regulator controls both live and exhaust steam for any purpose where steam is used, or it will control the direct steam when used alone. Is unlike, both in construction and operation, any device that has heretofore been designed for this purpose. Controls not only temperature of the dryers when paper is running over them, but maintains the same temperature whenever there is a break in the paper. This machine is most sensitive to any change in temperature of dryers, yet it has been found to be perfectly reliable and what is more, is not continually getting out of order. Also manufacturers of other steam specialties.



Trade LOCKE Mark

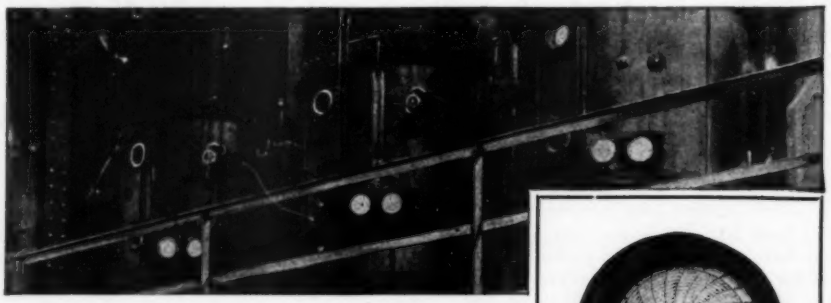
Reg. U. S. Pat. Off.

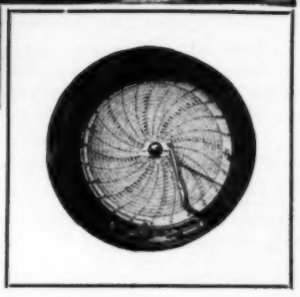
Locke Regulator Co., 76 North St., Salem, Mass.

"Locke" Regulator Agency, 39 Cortlandt Street, N. Y. C.

Canadian Representatives: Pearsall Brothers Limited, 1805 Delorimier Ave., Montreal, Can.

STEAM SAVING *in* The Soda Pulp Mill





Recovery of the soda used in cooking the wood chips, is essential to the commercial existence of the Soda Process for producing chemical fiber. Even so, and under the most favorable condition, recoveries seldom run higher than 90 per cent. It follows that all engineering effort is bent toward the most efficient recovery possible.

Evaporation of the black liquor is accomplished under vacuum, in multiple effect apparatus, because—the lower the pressure, the smaller the quantity of steam needed to do the work. Proper care makes possible a very material steam-saving. Economy and efficiency of process are more readily controlled when an instrument such as

BRISTOL'S RECORDING VACUUM GAUGE

provides a continuous chart of vacuum readings. A "BRISTOL'S" vigilance is unceasing—its accuracy, permanent.

Note that, by way of simplifying construction and facilitating operation, the penarm is attached direct to the pressure element.

Our engineers gladly will furnish you with authoritative information on the use of Vacuum and Pressure Gauges for use in the Pulp and Paper industry. Bristol's Gauges cover all ranges from full vacuum to 12,000 pounds pressure per square inch.

BRISTOL'S

The most extensive line of recording instruments, including: Pressure, Liquid Level, Temperature, Electricity, Motion, Speed, Humidity, etc. Also indicating instruments, and a wide range of temperature control equipment. Ask for our catalogs.

The Bristol Company *Waterbury, Connecticut*

FOR 36 YEARS — Ask Any Technical Engineer — MAKERS OF

BRISTOL'S RECORDING INSTRUMENTS

OHIO NEWS

Improvements in Franklin Board Co.

The Franklin Board & Paper Co., Franklin, has, within the last five years, practically rebuilt its paper board mill.

The first change was the replacing of a simple Lane and Bodley engine with a heavy duty tandem compound Hamilton Corliss engine, directly connected to the beater room line shaft. This change was made early in the year 1921. Then early in the year 1924, the Atlas Corliss engine, driving the constant speed line shaft of the machine, was replaced with a modern Hamilton Corliss engine.

In the same year, 1924, an addition forty feet wide by one hundred and fifty feet long was built to the finishing room.

Last year, a Shartle continuous beating system, complete with iron settling trough (four feet wide by one hundred fifteen feet long) wet machine and stuff pump, were installed. This continuous beater has been equipped with a Murphy Extractor, for removing the heavier material, such as iron, tin cans, etc., from the beater without the necessity of shutting down the beater. This arrangement is working in a highly satisfactory manner and is the patent of the superintendent, Mr. Lloyd T. Murphy.

Two Sturtevant Aerofin heaters have been installed in the beater room to take care of the heating and moisture. The six other beaters have been entirely rebuilt; two of them being equipped with Griley Unkle patent beater hoods. Two new three-plunger Shartle stuff pumps have also been added.

The paper machine has been rebuilt by the addition of another vat and cylinder (making seven cylinders on the machine). The dryers have been erected in The Black-Clawson patent vertical dryer frames and fifty-two dryers added, giving a total of one hundred and thirty-eight dryers. The dryer section is equipped with a patent Sheehan rope carrier. A new heavy duty Black-Clawson cutter has also been installed. A Cameron slitter and rewinder, the full width of the machine, is being installed.

The machine room has also been remodeled to accommodate the stack dryers. The east side of the room has been equipped with Bayley steel sash and wire glass, which makes a splendidly lighted room. The roof has been raised three feet and is of steel girder construction with Gypsum Pyrobar roof deck, covered with Johns-Manville Company asbestos and asphalt roofing.

A monitor five feet wide and ninety-six feet long, designed by the President, Mr. George Little, has been built on the machine room roof to take care of the vapor arising from the dryers. Mr. Little also designed the roof trusses. Besides the roof monitor, the machine room has in addition, eight Swartout ventilators, to aid in keeping the machine room dry and free of moisture.

The machine room is also equipped with a Ross Engineering Company absorption and ventilating system.

A three hundred horse power Babcock & Wilcox water tube boiler, equipped with Murphy Stoker and Diamond soot blower is also being installed, giving the plant five three-hundred horsepower Babcock and Wilcox water tube boilers, all equipped with Murphy stokers and Copes feed water regulators.

A Conveyors Corporation of American Steam ash conveyor takes care of the ashes.

Aside from the above, several minor improvements have been made.

This plant is officered by George Little, president; Fred B. Zartman, general manager and treasurer; Lloyd T. Murphy, second vice president and superintendent.

Annual Meeting of Raymond Bag Co.

The annual business meeting of the officials and representatives of the Raymond Bag Co., of Middletown, began June 8 and continued for three days. All of the salesmen of the concern assembled from many sections of the United States to discuss business matters, and to enjoy several social sessions.

The management always makes elaborate arrangements for

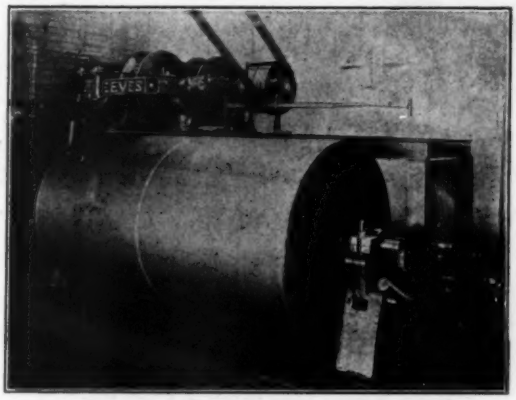


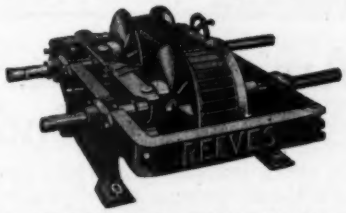
Photo shows a REEVES Transmission operating a Winder at the Cottalap Company, Sommerville, N. J.

Eliminate the Torn Sheets in Winding!

IT'S easy to reduce the waste in torn sheets on your winders when you have the REEVES Variable Speed Transmission. This simple device regulates the speed of the winder and synchronizes it with the speed of the paper machine so that the speed is changed for each difference in the size of the roll. The REEVES is so accurate and so sensitive that torn sheets are reduced to the minimum.

You should have all the facts about the REEVES. Write for catalog A-66 and full information about its application to Cylinder and Fourdrinier Machines, Cutters, Winders, Slitters, Pasting Machines and many others in your plant.

REEVES PULLEY COMPANY
Established 1887
COLUMBUS, INDIANA



THE REEVES Transmission is a simple, compact mechanical device which receives power at a constant speed and delivers it at any speed desired to any machine or group. It will maintain one set speed indefinitely, or may be changed instantly to meet any different operating condition. Accurate and dependable, always.

REEVES
Variable Speed Transmission

"Cleveland Type" Oil Film Bearings

"Smith Type" Hill Friction Clutches

"Industrial Type" Spur Gear Speed Transformers

There's a Reason Why
the Pulp and Paper Mill Industry Use

"Hill Clutch" Mill Equipment

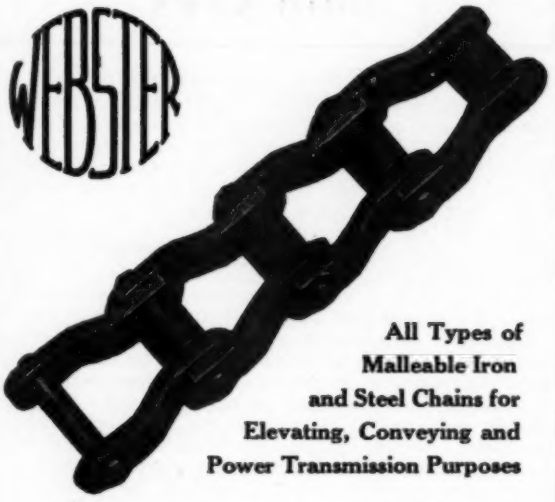
featuring

"Smith Type" Hill Friction Clutches
"Cleveland Type" Oil Film Bearings
"Industrial Type" Spur Gear Speed Transformers
"Steelarm" Automatic Belt Tighteners
Agitator Equipment of All Kinds
Flexible Couplings

Your wants mean more to us than "so much material." A careful study is made by Engineering Experts skilled in Power Transmission problems. You receive the accumulated experience of "half a century" serving the Pulp and Paper Mill Industry.

The Hill Clutch Machine & Foundry Co.
Power Transmission Engineers
General Office and Plant
Cleveland, Ohio

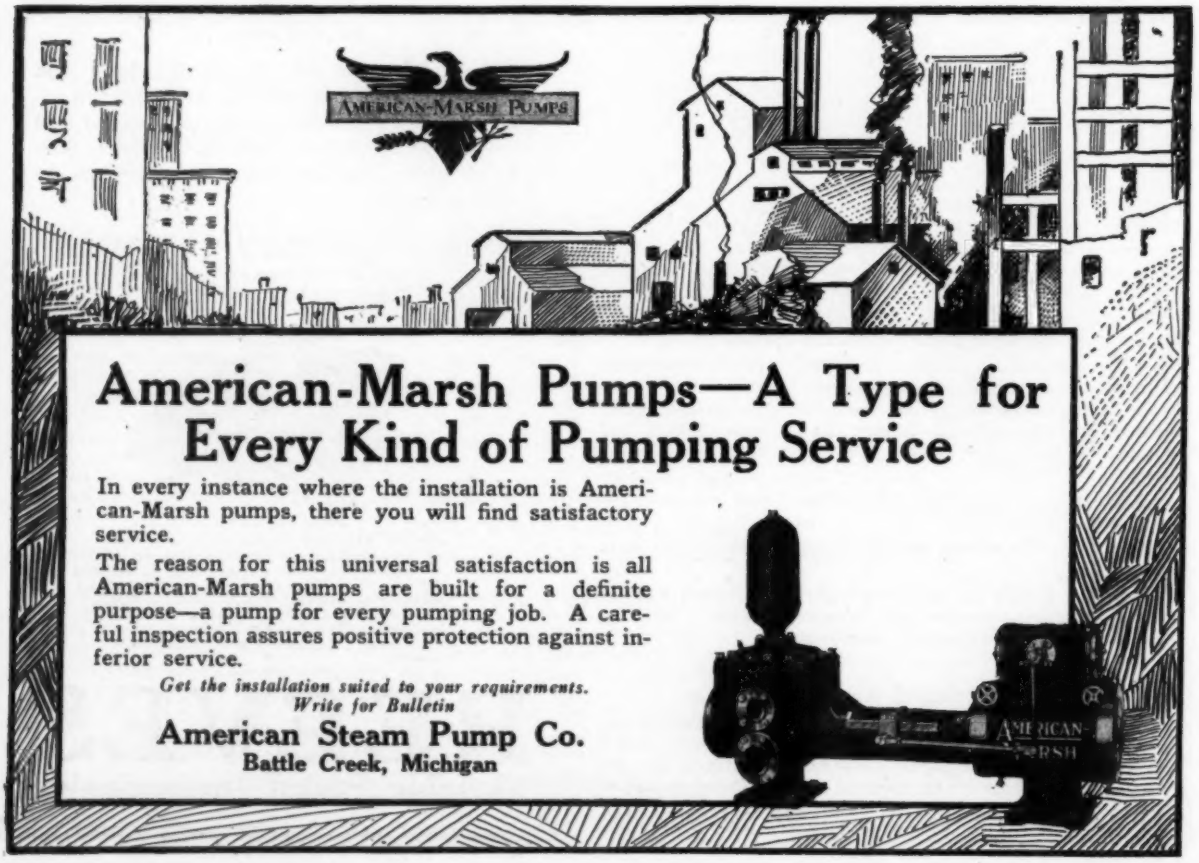
WEBSTER



All Types of Malleable Iron and Steel Chains for Elevating, Conveying and Power Transmission Purposes

We can furnish all types of malleable iron and steel chains, including plain detachable, combination steel and malleable iron, riveted drive, ley bushed, malleable iron roller and steel bushed roller drive chains. Catalog sent on request.

THE WEBSTER MFG. COMPANY
4500-4560 Cortland Street
CHICAGO



American-Marsh Pumps—A Type for Every Kind of Pumping Service

In every instance where the installation is American-Marsh pumps, there you will find satisfactory service.

The reason for this universal satisfaction is all American-Marsh pumps are built for a definite purpose—a pump for every pumping job. A careful inspection assures positive protection against inferior service.

Get the installation suited to your requirements. Write for Bulletin

American Steam Pump Co.
Battle Creek, Michigan

the annual meeting and this year's gathering was no exception to the rule. If anything, it was an improvement over the previous annual session as business conditions have been unusually favorable and every indication now points to a continuance of good times.

The demand for the famous Raymond paper bags has continued to steadily increase and salesmen brought in word that the next few months promised to develop an extraordinarily large volume. Salesmen and other representatives from the various branches throughout the United States were in Middletown for the event. The business sessions were held in the company's offices.

There were several features of entertainment, including a dinner and dance at the Butler County Country Club.

The Mid-West Machine Co., of Dayton, was recently incorporated at Columbus by Speed Warren, R. E. Cowden, N. S. Talbott, M. E. Steir and Francis D. Schnacke, for the purpose of manufacturing paper mill machinery. Much interest has been manifested in the venture, particularly as some of the incorporators have been prominently identified with the paper industry.

Liberty Magazine Considering Move to Hamilton

Hamilton may become the new home of the Liberty magazine, now published in Chicago, Ill. A letter directed to John E. Northway, secretary of the Chamber of Commerce, from Roy G. Fitzgerald, congressman from the Third district, states that Hamilton "has special advantages and would appeal strongly to any organization seeking the best location in the United States."

In the Congressman's communication, he states that the Liberty magazine will, in the near future, offer $50,000 to the Chamber of Commerce setting forth the most convincing arguments in support of a location or new site for that publication's plant.

The letter adds that John W. Murray, 114 West 44th Street, New York City, a representative of the magazine, told congressman Fitzgerald that Hamilton had various advantages that could not be overlooked. The writer said that this was true because of the location there of the Champion Coated Paper company and various other mills, the availability of skilled pressmen and other employees and the fact that Hamilton would be "a sort of economic center for distribution throughout the country."

Friends of Gustave Kaffenberger were deeply grieved, recently, to learn of his sudden death. Mr. Kaffenberger, who was vice-president of the Shartle Brothers Machine Co., had retired from business for the past few years because of ill health. He resided in Middletown until recently. He leaves to mourn his loss the widow and three children. The funeral, at which many paper men were present, took place from the Kaffenberger home on Hughes street, in Middletown.

Tissue Association Holds Conference

The regular quarterly conference of the Tissue Paper Manufacturers' Association was held in Middletown recently.

Z. W. Ranck, president of the association, presided. The morning session was spent in technical discussions of problems of importance to the tissue paper business. In the afternoon the member visited the Crystal Paper Company and Sorg Paper Company plants. Later in the day they were shown through the works of the American Rolling Mills Company.

Following the banquet at the Hotel Manchester, they were addressed by Arthur Walwyn Evans, humorist and lecturer of wide repute.

Champion Entertains Printers

The Champion Coated Paper Co., of Hamilton, recently entertained a train load of prominent visitors who came to the Miami Valley on one of the country's finest trains, the National Limited, of the Baltimore and Ohio railroad, when 125 printers and buyers of print paper visited the Champion mills.

All Kinds of
Exposed Gears
need Ohio Gear Grease for perfect lubrication under all conditions

Thoroughly lubricates each gear tooth—prevents direct contact—reduces noise and friction and increases power.

Water or weather will not affect it. Will not harden or dry up. A perfect lubricant for exposed gears under any conditions.

THE OHIO GREASE COMPANY
LOUDONVILLE, OHIO

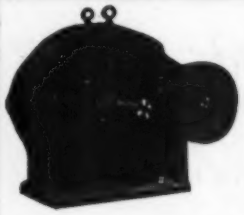
92c + 2 minutes = $1302.50

FACTS mean more than theory. What should happen or may happen is theory. What has happened is facts and a more reliable guide to what can be expected.

A large Paper Mill saved $1302.50 by investing 92c in Crescent Belt Fasteners. This is fact. The figures will be interesting to you. Write for them.

CRESCENT
BELT FASTENERS

CRESCENT BELT FASTENER COMPANY
247 Park Ave. New York, N. Y.



FAWCUS
Herringbone Gear Reductions

They increase production, save labor and decrease wastage on Calenders. Write for literature. Special Machinery—Couplings—Gears.

FAWCUS MACHINE CO., Pittsburgh, Pa.
2819 Smallman St.

MAGIC BOILER PRESERVATIVE
"The Pioneer Boiler Treatment"

Positively removes and prevents scale, stops minor leaks, pitting and corrosion

GARRATT-CALLAHAN CO.
310 South Michigan Avenue, Chicago

148-156 Spear St. San Francisco — 1328 Broadway New York City

MAGIC ESTABLISHED 1904

POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

Pittsburgh Piping & Equipment Co.
PITTSBURGH, PA.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers

RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

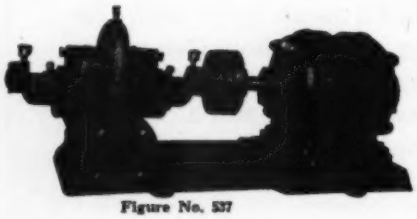
WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1926

"WEINMAN" PUMPS



"Weinman" type "LLB," ball bearing, double suction, centrifugal pump, directly connected to electric motor with flexible coupling.

Figure No. 537

The line combines two modern developments in papermaking—the centrifugal pump for all purposes, and the ball bearing.

Centrifugal pumps
with
Ball bearings

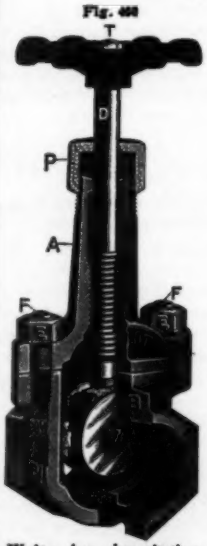
THE Weinman Pump Mfg. Co.

270 Spruce Street Columbus, Ohio

Branch Office and Warehouse: 210 Second Ave., Pittsburgh, Pa.

POWELL VALVES

"Pilot" Gate Valves



Write for descriptive Circular

All iron or iron body with steam bronze trimmings. Simple in construction.

Working Pressure up to 125 lbs.

Economical and Reliable

Avoid disappointment in Valve Service by specifying POWELL VALVES

The Wm. Powell Co.
214 Draper St.
Cincinnati, Ohio

Their visit was made the occasion of celebration at the mills where every convenience and comfort were accorded during their day's stay.

Among the guests were paper men from Philadelphia, Washington and Baltimore. When the visitors arrived they were immediately taken on a tour of inspection of the coated mills. Officials of the concern escorted the group through the plant and explained the details of manufacture.

At noon the visitors had luncheon at the new cafeteria of the mills after which the final inspection of the mills followed. The guests were taken in busses to the Butler County Country Club for dinner, which was an elaborate affair, featured by brief addresses and a special entertainment. Following the dinner and two hours of entertainment, the printers and dealers were taken back in busses to their waiting train.

E. T. Gardner, president of the Colin Gardner Paper Co., Middletown, has been named a member of the board of governors of the Miami Hunt and Polo Club for the season of 1926.

New Addition for Specialty Paper Co.

The Specialty Paper Co., of Dayton, has just obtained a permit for the construction of an addition to its factory at Miami Chapel Road and Brocton street, Edgemont. The improvement which will consist of a new building one story in height and of steel and concrete construction, covering a site 66 feet by 38, will cost approximately $10,000.

The new structure will increase the present floor space of the concern about 50 per cent, V. H. Wilshire, president of the company stated, and will prove a much needed improvement. A larger force of employees will be engaged and production will be increased. Frank Hill Smith, Inc., engineers, are in charge of the work of construction and will push the work to a speedy completion.

The same engineering company has completed plans for a large two and one-story warehouse for the Fairbanks Box Board Company at Middletown. The box board concern plans a heavy expenditure.

Fifth National Power Show Coming

The Fifth Annual National Exposition of Power and Mechanical Engineering will be held in the Grand Central Palace, New York City, from December 6 to 11 inclusive.

Preliminary plans indicate that this exposition will be even greater and more inclusive than the fourth. Three entire floors of the Palace and a portion of the fourth have been sold to exhibitors. Contracts have been signed with 332 manufacturers of all types of mechanical and power plant equipment.

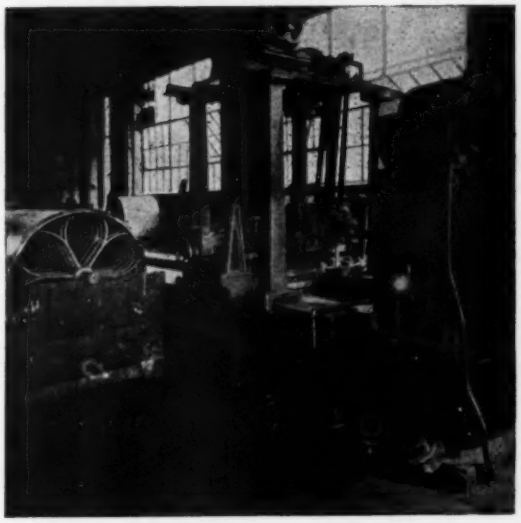
An important innovation in the conduct of the coming exposition will be the addition of several exhibits essentially educational in character, which point out the tremendous advances that are being made in mechanical design and construction.

The exhibition managers are assisted in the conduct of the exposition by an Advisory Board made up of representatives of technical societies in the mechanical field, and also representatives of large users of mechanical equipment who are interested in maintaining the high standing of the exposition. The managers of the exposition are Charles F. Roth, and Fred W. Payne of the International Exposition Co., Grand Central Palace, New York City, to whom all inquiries should be addressed.

The Rosser Sales Co., Bangor, Me., selling agents for J. & C. Portable and Mill Type Rossers, announces that it has recently received an order for one of their "Baby" Rossers from Finland. The Rosser was shipped from Portland, Me.

The construction of the new Ranger School building near Wanakena, Cranberry Lake in the Adriondacks, will be resumed this summer. Bids for completing the building will be opened at 2 P. M. Tuesday, June 29, at the College of Forestry. All bids should be addressed to the Hon. John R. Clancy, vice-president of the Board of Trustees, New York State College of Forestry, Syracuse, N. Y.

RHOADS Watershed Tannate Leather Belting



The four belts on the Farrell roll grinders in our picture do not show very plainly, but they are doing a good job at "selling" this paper mill on Watershed Tannate Leather Belting. For they have lasted more than twice as long as the oak belts previously used.

About three years ago, this paper company bought their first Tannate belt. Now they have Tannate on these grinders, on elevators, re-winders and beaters.

Other paper mills also are replacing rubber and oak belts with Watershed Tannate. Its stronger grip and its longer life on hard drives make it economical.

It is always sold under the Rhoads Service Guarantee.

Specify Rhoads Watershed Tannate on your next belt order.

Use Rhoads Tannate Lace Leather
It outlasts rawhide three to five times

J. E. RHOADS & SONS

PHILADELPHIA.....47 North Sixth Street
NEW YORK.....112 Beekman Street
CHICAGO.....334 West Randolph Street
ATLANTA.....80 North Forsyth Street
CLEVELAND.....1234 W. Ninth Street

Factory and Tannery: Wilmington, Del.

IF WE CAN MAKE RUBBER PRESS ROLLS (Snappy and Tough)

THAT TAKE MORE WATER OUT
THAT ARE EASIER ON THE FELTS
THAT STAND UP BETWEEN GRINDING

Longer than the ones you are using, it will pay to send your rolls to us if you are three thousand miles away. Some mills are doing this.

STOWE & WOODWARD COMPANY

The Rubber Roll Makers NEWTON UPPER FALLS, MASSACHUSETTS

Pickles' Patent Automatic Steam Regulator

FOR

Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES **Buckland, Conn.**

Here is an

Electric Hoist

that makes a Chain Block seem an extravagance.

ROEPER Type "R" Hoists are built in capacities from 500 lbs. to 4000 lbs. with or without trolleys—Cord or Push Button Control.

Send for Circular

Roeper Crane & Hoist Works, Inc.
1729 North Tenth St. READING, PA.

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

Have You Run Them?
If Not, Why Not?

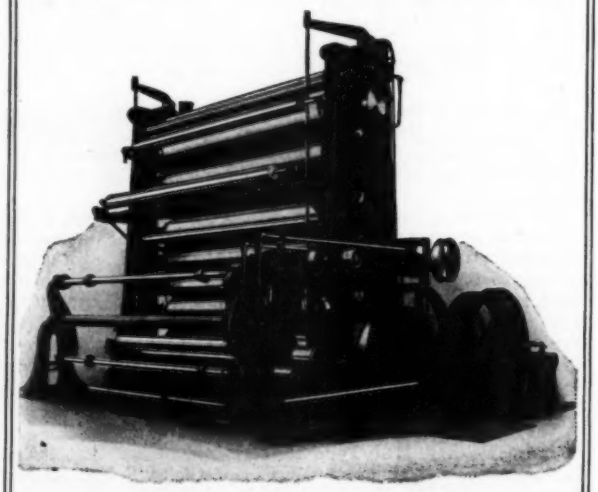
Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.

NORWOOD SUPER CALENDERS



WE ARE SPECIALISTS IN

Paper Finishing Machinery

NORWOOD ENGINEERING CO.
FLORENCE, MASS., U. S. A.

NEW ENGLAND NEWS

Freight Rates Under Discussion

Freight-rate controversies occupied considerable attention during the past month. The New England Freight Association is not projecting any more advances at this time, but there remains the salt rate case involving rates on rock salt from New York state points to New England points. Exceptions were filed to the examiner's report by interested New England mills. Manufacturers who use the rock salt in making their own bleaching compounds are the big buyers of the material. The increased rate proposed is 27 cents against 24 cents per 100 pounds previously.

The case is rather unique in that the advance is not favored by the originating carriers in New York, but has the approval of the Commission. This is due to a western decision of the I. C. C. whereby rock salt and common salt were put into the same classification. In order to make the rate situation uniform it was ordered by the I. C. C. that the rates be made the same on rock and common salt throughout the east.

The formal leasing of a 105-mile stretch of the Boston & Maine R. R. by the Canadian Pacific, halts for the time being a rate complaint against the B. & M. by the Ryegate Paper Co., of East Ryegate, Vt. The rate was on pulpwood from Quebec points to the mill. It is believed that the Canadian railroad will be more amenable to settling the difficulty without recourse to the I. C. C.

The most surprising element in the hearing on freight increased rates within 50 miles on the Boston & Maine R. R. heard early in the month at the Federal Building, Boston, before Examiner McGrath was the divulging of the big tonnage of waste paper that moves from the Pacific Coast via Boston to mills at Fitchburg and Leominster, Mass. This is chiefly old book stock and during a period of a month and a half figures submitted by the railroad itself showed that 1,204,000 pounds were brought to Boston via the Panama Canal and transshipped by rail to Fitchburg and West Fitchburg. Inasmuch as this case involves a suspension of rates, which suspension ceases as of July 15th, it is expected that the Examiner's report and the Commission's decision should be forthcoming in the near future.

Labor Troubles at Holyoke

The most disturbing factor in the paper mill situation of New England at this writing is the labor situation at Holyoke, where the Eagle Lodge of Paper Makers, the local branch of the International Brotherhood of Paper Makers, is preparing demands for a 40-hour week and a minimum wage of $1 per hour so that no employee would average less than $40 per week. The Secretary of the Holyoke union has already addressed each manufacturer regarding a conference on the subject. Changes in working conditions other than those mentioned are also desired.

From the manufacturers little word has been received anent the subject. In the case of the American Writing Paper Co., it is suggested that Labor Commissioner Adam Wilkinson would probably represent the company. It is not known whether the matter will be handled jointly or individually by the various mills but the latter method will probably prevail, as there are several mills whose operating conditions more nearly approximate the union demands than others.

The Premoid Mfg. Co., of 13 Wormwood St., Boston, manufacturing in a part of the Springfield Glazed Paper Co. plant at Springfield, Mass., is making an intensive drive to market its product through paper merchants. The product is trade marked "Premoid" and is a rubberized paper, based on patents granted to Kirk L. Moses of Boston. The rubber latex is coated on the paper base, in contrast to the mixing in the beater of the English process. The paper used is manufactured by Hollingsworth & Vose Co. by a special process. The Premoid Mfg. Co. has to date disposed of the major part of its output to shoe manufacturers, where it has displaced artificial leather, cloth and even leather itself. Through paper merchants, Mr. Moses, the vice-president and general

Progress in Paper Making

WITH progress in American paper making, we are concerned and connected. To commemorate the advances that have been made, the more important annals of the industry will be recalled from month to month in this space.

First American Sulphite Mill

The manufacture of Sulphite Pulp on a commercial scale in America, was first accomplished by the Richmond Paper Company of East Providence, R. I. They commenced operations in 1883 and succeeded in producing a pulp of fine quality, but the engineering difficulties encountered in the development of suitable digesters proved too costly and the company failed in 1887.

Established 1842

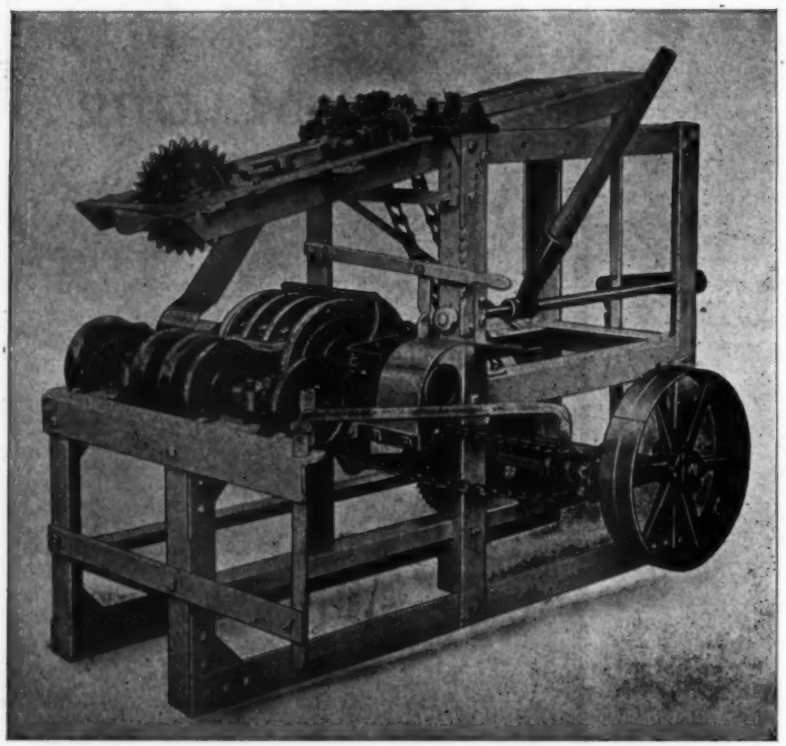
Cheney Bigelow Wire Works

Experienced and Progressive

Fourdrinier and Cylinder Wires
Dandy Rolls and Cylinder Moulds
made and recovered

SPRINGFIELD, MASSACHUSETTS

Clean Wood for Clean Pulp



—Reduced Costs
Can be accomplished by use of our Rossers.

Recent installations—
Great Northern Paper Co.
Eastern Mfg. Co.
Fraser Co.'s
Nashwaak Pulp & Paper Co.

Manufactured and Sold in Canada by
The Smith Foundry Co., Ltd.
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Rosser Sales Co.
Room 62, 27 State St., Bangor, Maine
Agents
J. & C. Portable Rosser Co.
Bangor, Maine

Write for price and further information

For Portable and Mill Use

Profit by Tide Water's *Lubrication Experience*

THE Tide Water Engineering Bureau is at your service in solving all lubrication problems. This expert service is entirely *without cost or obligation.* Send a card today and one of our Staff Engineers will be glad to call at your mill to make a lubrication survey under your direction.

The Tide Water Power Group
—for paper mill lubrication

TYCOL GEAR COMPOUND
A soft, semi-fibrous grease for enclosed gears under heavy pressure.

TYCOL MEDIUM YARN GREASE
For beater bearings where high temperatures, heavy pressures and water are present.

TYCOL YARN GREASE
For dryer and other bearings operating at high temperatures.

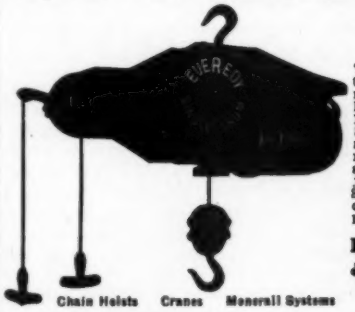
TYCOL LUBRICANT NO. 1
A medium hard grease for Jordans, grease lubricated calender rolls, and for general use.

TYCOL GREASE
A hard grease for replenishing Tycol Yarn Grease.

TYCOL GEAR COATING SOFT
A viscous lubricant especially recommended for use on slow-moving open gears.

TIDE WATER OIL SALES CORPORATION
11 BROADWAY NEW YORK

500 lb. Electric Hoist
$225.00



This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy—40 feet per minute A. C., 35 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

READING CHAIN & BLOCK CORP.
READING, PA.

Chain Hoists Cranes Monorail Systems

TABER-PUMPS
CENTRIFUGAL & ROTARY

These sturdy, bronze fitted, double suction pumps are particularly suited for all classes of water service. Durable and efficient. Send for Bulletin No. 30.

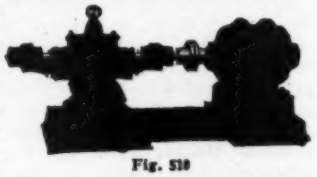


Fig. 510

TABER PUMP CO. Buffalo, N. Y.

manager, hopes to build up a market among bookbinders, for catalog covers and for document envelopes. It is waterproof, wear resistant, and does not fray or tear. The Company is a Massachusetts corporation, Louis E. Vose being president; Mr. Moses, vice-president and J. W. Edson, treasurer. The coating with rubber is done at the Springfield works.

Judge Morton in the Federal District Court at Boston, has appointed Daniel Lincoln referee in the adjudication of the bankruptcy of the Highland Lake Paper Co., building paper manufacturers of Norfolk, Mass. This company was petitioned two months ago by the North Shore Waste Paper Co. of Salem, P. H. Graham & Son of Boston, and Braver Healey Co. of Boston. A complete list of creditors has now been filed and liabilities total $91,018, of which $47,000 are mortgages and $8,402 is a conditional sale agreement. All other liabilities are unsecured. The apparent assets, deducting mortgages, total but $30,674. Other unsecured creditors include the Lockport Felt Co., of Newfane, N. Y., and the Nashau Package and Sealing Co., of Nashau, N. H.

William Dunlop, one of the best known of the younger school of paper makers in Holyoke, Mass., has been taken from the Paper City by the Crystal Tissue Mills of Middletown, O., where he is to become assistant general superintendent. Mr. Dunlop started his papermaking experience in Scotland with Robert Braig & Son with whom his father was associated for 35 years. He came to Holyoke and entered the employ of the Parsons Paper Co., where he attracted the attention of the McCorkindales of Millers Falls. He worked in their mill for some time and later returned to Holyoke where he was employed in the Wauregan mill of the American Writing Paper Co.

The National Blank Book Co., of Holyoke, Mass., well known paper converters, have offered to their employees 6,000 preferred shares of stock, par value $50, preferred as to dividends and assets and paying 8 percent per share. As the company is paying dividends on its common stock and is in excellent financial condition these employee shares are quite an attractive investment to the workers. Other New England mills are said to be contemplating similar plans of offering attractive stock investments in the concern.

Boston P. T. A. Hold Outing

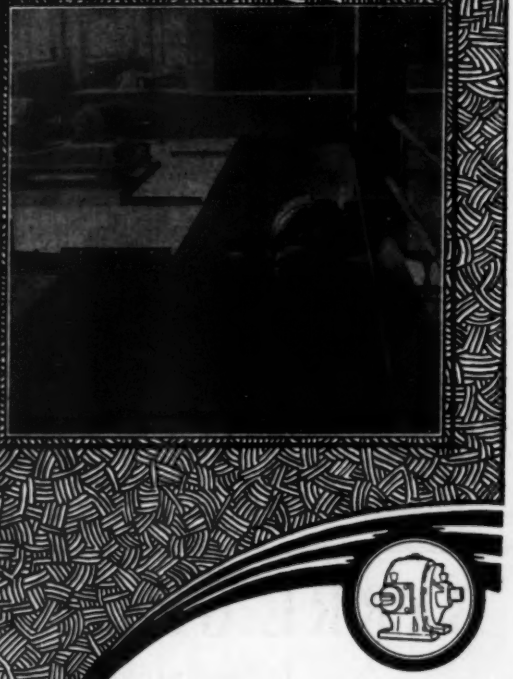
The regular annual summer meeting and outing of the Boston Paper Trade Association was held at the Charles River Country Club, Newton Centre, Mass., on Tuesday, June 8, at 1:45 P. M. The usual Golf Tournament for the Boston Paper Trade Association Championship Cup was held and the novel feature of a Kicker's Handicap was included in the regular play. A baseball game between manufacturers and merchants and various other sports including bowling on the green, quoits and tennis were enjoyed. Prizes were presented at dinner which was held in the Club House.

Philip Weston, president of the Byron Weston Co., of Dalton, Mass., and Herbert Wingate, assistant secretary of C. H. Dexter & Sons of Windsor Locks, Conn., were elected members.

New England printers have been guests of Strathmore Paper Co., on a number of occasions during the first half of the year. One of those who has co-operated in providing visits of inspection to the Mittineague and Woronoco mills are Carter Rice & Co., Corp., Boston merchants, whose service department head, J. F. Wilson, has conducted no less than four groups of printers to Strathmore and Old Colony Envelope Co. plants at Westfield during the year.

In furtherance of S. L. Willson's policy of concentrating production in Holyoke, the American Writing Paper Co., is to sell its property in Mittineague, the well known Agawam mill. Other outlying properties are to share a similar fate but the Mittineague mill (only one of the two plants owned at that place have been operated during recent months) will be the next to be disposed of. Steps are already being taken to transfer the tonnage formerly made there to certain of the

GANSCHOW



Ganschow Type "B"

The Ganschow Type "B" Speed Transformer has made possible more efficient application of power at reduced speed in many places where old methods were awkward and wasteful.

In power plants, machine shops and many other industrial applications — for stoker drives, *line shaft drives*, machine tool operation and dozens of other uses, the Ganschow Type "B" makes an ideal power transmission unit.

It drives at right angles to the plane of the motor shaft and propels a driven shaft from either or both sides.

Catalog 111 tells a story about Speed Transformers that you want to know. What is your address?

THE PLANETARY PRINCIPLE OF SPEED REDUCTION IS THE MOST EFFICIENT

William Ganschow Company
1015 W. Washington Blvd. Chicago

SAN FRANCISCO - - - - The Percy E. Wright Engineering Co. - - - - - - SEATTLE
BIRMINGHAM - C. B. Davis Engineering Co. SALT LAKE CITY - F.C. Richmond Mchy. Co.
BOSTON - - - - - - - Allen & Drew PITTSBURGH - - - - H. S. Stockdale
NEW YORK - - - L. C. Bigelow & Co., Inc. PHILADELPHIA - - R. E. Spencer Gears
DETROIT - - - - - F. J. Hindermiller

Ganschow
SPEED TRANSFORMERS
CUT GEARS · FABROIL NOISELESS PINIONS

Meisel Sheet Cutters

Automatic Intermittent Feed Sheet Cutting and Slitting Machine

Cuts all kinds and thicknesses of paper from news to the thickest box board, various kinds of cloths, combined cloth and paper, tinfoil and other material taken from the web.

Sheets up to 132 inches in length may be cut

Ask for Photograph C-1001

MEISEL PRESS MFG. CO.
942 Dorchester Ave. Boston, Mass.

SIMONDS CIRCULAR SAWS

Mills equipped with Simonds Circular Saws provide longer runs at less cost, because Simonds Saws hold their edge longer and cut fast. Simonds Saws have the steel, temper and tension.

Simonds Saw and Steel Co.
Established 1832 - Fitchburg, Mass
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BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company
BARRE, VT. BOSTON, MASS.

Holyoke mills which are well equipped to take it over. Various grades of fine cover, manuscript, linen ledger bond and similar papers have been made at the Mittineage mill. Mr, Willson has promised employees that so far as possible openings will be made for them in Holyoke.

C. Frank Young, traffic manager of the Oxford Paper Co., of Rumford, Me., announces that he has secured the charter to two Norwegian steamers, the Smaratia and the Steinstad, the first named to inaugurate the summer pulpwood carrying season about June 21st. They will carry pulpwood from the Oxford's Canadian timberlands via Cape Breton to Portland, Me., where it will be discharged by the Portland Woodhandling Co.'s plant. The two freighters are registered at about 1,500 tons each and will carry approximately 1,600 cords of wood each trip.

The latest development in the birchbark papers of Hazen Paper Co., of Holyoke have been introduced to the New England trade and have made a good impression. John Hazen has been personally canvassing the trade with samples of these papers.

A new sales policy has been adopted by the Associate mills of Crocker McElwain Co. and the Chemical Paper Mfg. Co. of Holyoke. Under the former policy a sales representative of the company specialized in one particular line or group of papers. The new system envisages a representative with knowledge of all lines for each sales district. Under this plan which has been put into effect, Wallace H. Graves visits and maintains contact for the Associate mills in New England, Thomas Harrington for New York and Hobart J. Shanley for Detroit and Cleveland.

The New England Foreign Trade Conference was held at the Copley Plaza Hotel on May 26th and 27th. Several paper companies sent representatives to the conference, the most important result of which was the resolution adopted to improve credit facilities for foreign buyers in this country. Edmund Burke, sales manager of the Brown Co. of Portland and Berlin, N. H.; W. L. Carter, president of Nashua Gummed & Coated Paper Co.; James W. Cass of the Rogers Fibre Co.; B. F. Copeland of Bird & Son; Clyde B. Morgan, treasurer of the S. D. Warren Co.; Donald J. Moore, export sales manager of the Fibreloid Co. of Indian Orchard, Mass.; John G. Russell of the Russell Co.; James A. Taylor of Brown Co., and Roger D. Smith, president of the S. D. Warren Co., were among the paper mill representatives who attended the conference and took part in the discussions. Each commodity manufacturer will in the future be able to refer to a "group adviser" which in the case of the paper industry of New England will be a representative of the Dennison Mfg. Co. of Framingham and Boston.

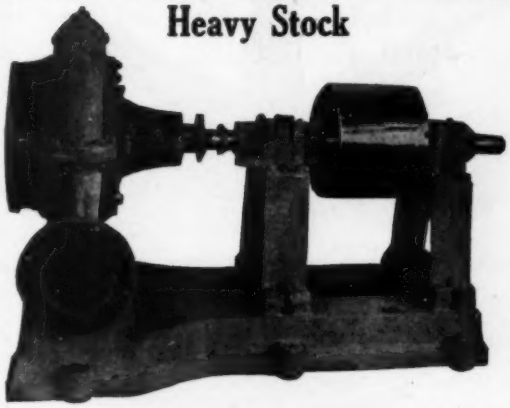
A worth-while new line of cover papers is being introduced to the trade this spring and summer by the Advertisers Paper Mills of Holyoke. It is to be known as Maidstone Cover. It is a medium-priced cover paper available in several colors and white and the two weights for cover and leaf of high-grade books.

A Correction

A report in the May issue of THE PAPER INDUSTRY, stated that James Dearden, purchasing agent of the Strathmore Paper Co., had resigned from that company and accepted a position with the Rourke Eno Paper Co., of Hartford, Conn. This we desire to correct. C. W. Dearden, brother of the purchasing agent, is the man who has resigned from Strathmore. He has purchased an interest in the Rourke Eno Paper Co., of Hartford. C. W. Dearden was formerly in charge of sales promotion and advertising at Strathmore Paper Co. James Dearden continues with the manufacturers.

A bibliography covering the history, technology, economics, and statistics of the paper industry in Russia from 1800 to 1924, was compiled by F. Yevgenyew, and published by the State Printing Office at Moscow in 1925.

8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock



Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

LAWRENCE MACHINE COMPANY
LAWRENCE, MASS.

Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

A BETTER JOINT FOR YOUR CONVEYORS

A butt joint that is *tight;* the belt is compressed between the double plates in a vise-like grip which gives FLEXCO H. D. Belt Fasteners their reliable reserve of strength, so readily acceptable to hundreds of operators. Sizes for belts, ¼ inch thick and up.

for Heavy Duty Transmission

The smaller sizes of FLEXCO H. D. are also recommended for heavy power transmission service.

AN OFFER: Try an installation on a "make good" basis. Write, sending details of drive. Our consulting service at your disposal.

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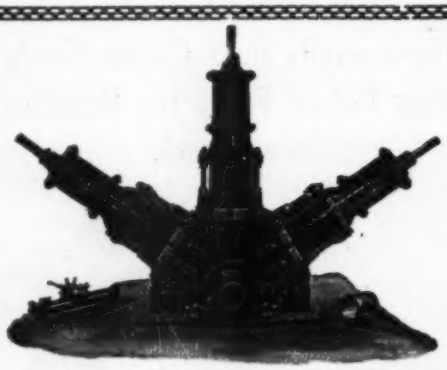
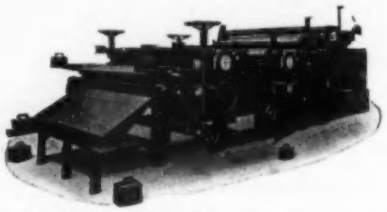
4675 Lexington Street Chicago, Illinois



Standard Wood Pulp Grinder

Built in Three Sizes

Taking wood 24″, 30″ or 32″.
Bridge-trees—Are well proportioned.
Flanges—Made of steel, 40″ diameter.
Hydraulic Cylinders—Copper lined, 12″, 14″ or 16″ diameter.
Pillow Blocks—22″ length of bearing.
Pockets—Very heavy and designed particularly for free discharge of pulp.
Service—Continuous distinctive service is always assured.

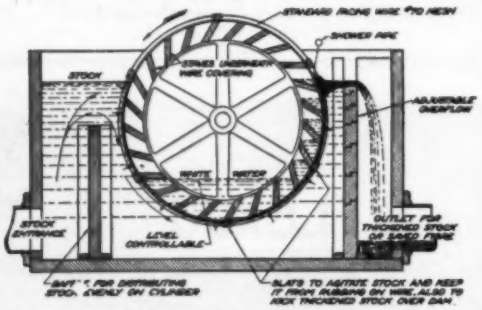


Rogers and Special Wet Machines

IMPROVED AND SIMPLIFIED
SINGLE AND DOUBLE PRESS
FOR CONVERTING CHEMICAL PULP INTO SHEETS 48% DRY

25-35 TONS air-dry pulp per 24 hours. Built in 72″ width, with patented pulp weakening and separating device or our new automatic knife cut-off attachment. A real labor saver.

FREIGHT CHARGES are greatly reduced. Savings on this item alone often pay for the machine in one year.
All infringements will be vigorously prosecuted



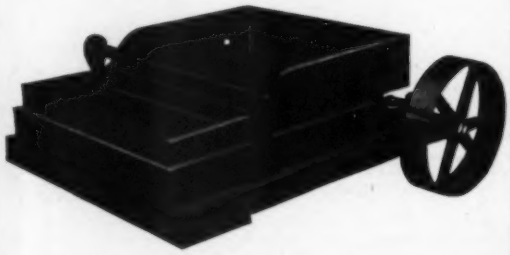
A. D. Wood Machine

Used as Pulp Thickeners, Savealls, Pulp Washers and Water Filters

ADVANTAGES:

Reduced Wire Costs	No Couch Roll
Enormous Capacity	Minimum Repairs
Only 2 H. P. Required	No Doctor
Works Automatically	Requires No Attention

OVER 200 MACHINES SOLD AND IN USE



Wells Undulating Knot and Sliver Screen

Separates knots and slivers from all kinds of pulp efficiently, continuously, automatically with negligible cost for operation and upkeep. Simple but rigid construction. Only best materials used. Operation in plain view. Broken plates quickly found mean fewer holes in fine screens and better stock. No rotor to plug and be strained should belt run off.

40 Tons Per Day. Write for Blueprint

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

OUR LINE IS MANUFACTURED IN CANADA BY

THE NORTHERN FOUNDRY & MACHINE CO., LTD., SAULT STE. MARIE, ONT.

See pages 346 to 347 in the 1925 Paper and Pulp Mill Catalogue

PACIFIC COAST NEWS

To Finance New Mill

It is reported that H. C. Hanke, eastern paper mill operator, is to assist in financing a $1,500,000 paper mill at Aberdeen, Washington, and further that he will have direct management of the mill. W. E. Johnson, secretary of the chamber of commerce at Aberdeen, who was in the East during the latter part of May, completing the plans for financing the enterprise, is convinced that paper can be manufactured at a low cost in Gray's harbor. Gray's harbor has an abundance of raw material and low rates for water and power, he pointed out.

William R. Money took a position with the Crown-Willamette Paper Co., about the middle of May, as superintendent of their paper mills at Lebanon, Oregon. For the past three and a half years, Mr. Money was employed by the Hawley Pulp and Paper Co., in Oregon City, where he was assistant superintendent of the plant.

Of the 3,290 tons of freight shipped over the port of Astoria during the week ending May 23, 540 tons were paper pulp which was being discharged.

The two carloads of box boards which were taken aboard the McCormick freighter Silverado for California points on Tuesday, May 11, was the first shipment via water which has been made by the Pacific Straw Paper and Board company, operating a paper mill on the waterfront at Longview, Washington. They are planning to make three and possibly four more shipments by water to California within a short time.

Executives Hold Conference

The third annual general conference of the Pacific coast executives, superintendents and department heads of the Crown-Willamette Paper Company, met at the Columbia Gorge Hotel, famous scenic hostelry on the Columbia highway at Hood River, May 24-28, to discuss internal problems. The further purpose of the conference was to afford an opportunity to the company's executives to become better acquainted with members of the organization in Portland, West Linn and Lebanon, Oregon, Camas, Washington, Floriston, Cal., and Ocean Falls, B. C.

Louis Bloch, president, and A. J. Lewthwaite, vice-president from executive headquarters in San Francisco were among those who attended. Albert Bankus, manager at Portland, had direct charge of the program. Business meetings were alternated with golf, dancing, dinners, card games and music.

According to the Journal of Commerce, Seattle, business volume reported by producing paper and board mills of the state shows a total somewhat under the record for the corresponding period of last year, according to a survey just completed. The decline amounts in some instances to as much as ten per cent. Level of prices being about the same as last year. Shrinkage in volume is shown, but the trade is not pessimistic.

The Pacific Coast Paper Mill, at Bellingham, Wash., has awarded a contract to the Puget Sound Bridge and Dredging Company, Seattle, for the filling of a block of tide lands at Bellingham on which the concern will build a $150,000 shag mill for manufacture of cheap tissue paper from pulp. The mill will be in operation in four or five months according to George H. Bacon, director in the Pacific Coast Paper Mill. The mill will be 300x40 feet in size. Pile driving for the foundation will be begun at once.

Word from W. E. Johnson, secretary of the Aberdeen Chamber of Commerce virtually assures a pulp and paper mill on Gray's Harbor. Johnson is in the East attending conferences with Eastern operators relative to construction of a harbor plant. Johnson sent word west that details of the project

Hush the hiss
—use Jenkins Packing

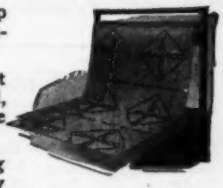
Hush hissing pipe joints; stop steam leaks and waste—use Jenkins Packing.

And stop the leaks you do not hear, for dripping water or oil, unnoticed, may cause expensive damage.

It pays to give piping a spring overhauling, and to pack every doubtful joint with a Jenkins Packing specially suited to the service.

Each Jenkins packing is extremely tough and durable and can be relied on not to crack, crumble or squeeze out of the joint.

Write for our latest Packing and Gasket folder.



Jenkins Packing include JENARCO, a red vulcanized packing for hot and cold water and saturated steam, JENKINS '96, a black unvulcanized packing for hot and cold water and saturated steam at all pressures, OILTITE, as its name implies for oil service, and COMPRESSED ASBESTOS JOINTING for high pressure super-heated steam.

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VALVE MAKERS FOR OVER FIFTY YEARS

Davis Float Valve

Simplicity

... to end tinkering with valves

THE Davis Float Valve *is* simple, built to serve for a long time without extra attention or expense. This valve has no leather cup packing. The inner valve cannot stick. It will not permit leakage from the top. It closes tight. The inner valve has a hollow post, and is operated solely by pressure. The stem is directly connected to the float by a lever and forms an auxiliary valve that seats in the hollow post. These features mean trouble-free service.

DAVIS VALVE SPECIALTIES
STEAM SAVERS SINCE 1875

G. M. DAVIS REGULATOR CO., 422 Milwaukee Avenue, Chicago, Ill.

Paper Machinery Specialists—For Sale

Six Rogers Wet Machines—Excellent Condition. One Practically Brand New Badger Webre—Total 6500 Square Feet—Triple Effect—Complete. Six Glens Falls Sulphur Burners—All Sizes. Phone—Wire—Write. Consolidated Products Co., Inc., Dept. H, 15 Park Row, New York City.

WANTED—Could you use a man experienced in Purchasing Supplies, Production Costs, Traffic, Office Management, etc. Address Box 98, The Paper Industry.

WANTED—A small Jordan engine in good condition, of about the size of a Noble & Wood Pony Monarch. Must be priced right. The Cellulo Company, Sandusky, Ohio.

Robins Conveying Systems

FOR HANDLING BULK MATERIALS

Write for Handbook of Conveyor Practice

ROBINS CONVEYING BELT COMPANY

New York Chicago Pittsburgh Boston

Paper Mill Machinery

PAPER MACHINES
One 118" Fourdrinier tissue machine.
FOURDRINIER PARTS
Pusey and Jones design.
CALENDERS
106" nine roll. 72" nine roll. 62" seven roll. 64" seven and nine roll.
WINDERS
124" Warren. 72" Moore & White four drum. 82"-72" Langston.
MARSHALL DRIVE
Complete Pusey & Jones and Rice, Barton & Fales for paper machines.
SHEET CUTTERS
110" Hamblet. 110" Horne. 70"-54" Moore & White. 60"-52"-48" Hamblets.
REAM CUTTERS
54" Holyoke Seybold. One 44". One 38". Twentieth Century Seybold.
LAYBOYS
102". Two 72". Three 52" Erie single. One 72", two 60" Moore & White.
SUPER CALENDERS
56" seven roll Holyoke. Four 68" Holyoke. One 62", one 60", one 45" Norwood.
SUCTION ROLLS
104"-126" Millspaugh with Connersville pumps.
STUFF PUMPS
Six Deane triplex 12x12. One Deane triplex 9x8. Four 5" Post.
BEATERS
Two Jones 65x57. One Holyoke 60x60. Three Horne 36x36.
JORDANS
One large Horne. Two N. & W. Monarch. One Jones Standard.
RAG CUTTERS
Taylor Stiles No. 11. One No. 2 Daniels.
WASHER
Jones 65x57 equipped with four cylinder washers.
TWO NO. 2 LANNOYE PULPERS.
Variable speed steam engine, ERIE BALL, 12x12x14.
Revolvator.
Three 72" Sandy Hill wet machines.
Two Shredders, MITTS MERRILL, No. 17.

For sale by

FRANK H. DAVIS CO.

175 Richdale Ave. Cambridge, Mass.

WANTED:—Experienced Chemist Engineer for Canadian Mill, capable of carrying on control and research work in connection with sulphite, groundwood, and Paper Mill Operation including complete control of color matching. Reply, stating experience and salary required, care of Box 90, The Paper Industry.

Help Wanted

Men with finishing room experience for finishing, inspecting and supercalendering. Also helpers and understudies for above mentioned jobs. Reply stating experience, age, wages expected, and why you wish to leave present job. Also state kind of paper and stock with which you have been working. Apply Box 96, The Paper Industry.

Help Wanted

Back tender capable of promotion to machine tender, and third hands capable of promotion to back tenders. Reply stating experience, age, wages expected, and why you wish to leave present job. Also state kind of paper and stock with which you have been working. Apply Box 97, The Paper Industry.

Rebuilt Cutters
for the
Large Paper Mill

We own and offer a number of excellent values in Paper Cutters, among which are the following:

60" Sheridan Automatic Paper Cutter
63" Oswego Power Paper Cutter
68" Oswego Automatic Paper Cutter

Write for a complete list, with prices.

We are Headquarters for all kinds of Rebuilt Printing and Lithographing Equipment.

Thomas W. Hall Co.
INC.
575 Washington St., New York

have been completed. H. C. Panke, head of a large plant at Wisconsin Rapids, is expected to come west with him.

General work contract in connection with the construction of the plant building planned by the Rainier Pulp and Paper Company of Shelton, a unit of the Port Angeles Paper Company has been awarded to Chris Kuppler & Sons, general contractors. The main plant building will be 1500x110 feet in size. The contracting firm is now building a paper plant at Port Angeles.

Forest examiner, J. P. Williams, and a crew, have left Ketchikan, Alaska, to make an examination of water power sites in the Manzanita district, immediately opposite Ketchikan on Revillagigedo Island on Etolin Island near Wrangell, Taku river and Glacier Bay. Some time in June, Williams planned to take a crew to survey for pulp timber on the West coast of Admiralty Island.

A campaign is under way to induce pulp and paper manufacturers to come to Southeastern Alaska and establish manufacturing plants. Assistant District Forester B. F. Heintzleman recently left Seattle for eastern centers to interest paper makers in possibilities of Alaska.

The will of the late Norman R. Lang, manager of the Powell River Pulp and Paper Company, was admitted to probate May 16th at Vancouver, B. C., and showed an estate of $798,-483. His widow, son and daughter are the only beneficiaries.

Neutral Sulphite Cooking Process

The employment of a modified Keebra process for the pulping of esparto grass is proposed by James d'A. Clark, who recently returned to London after a lengthy experience in American paper mills. The Keebra process, as explained by Mr. Clark, who operated it at the mills of the Canada Paper Company, consists of boiling the raw material with a pure solution of neutral sodium sulphite in the same way as in the usual soda process, except that for wood a higher pressure is required. There is a modified Keebra process which is conducted in the same way as the ordinary soda process but with a percentage of sodium sulphite replacing caustic soda, so that it is an alkaline process instead of being a neutral sulphite one. Whereas in the case of the regular Keebra process a pressure of 130 pounds per square inch is required in the cooking of wood, with the modified process, the pressure need be no higher than 80 pounds. There is no difficulty in the soda recovery and no smell.

In the cooking of esparto a lower pressure of 50 pounds can be used for the full Keebra and 30 to 40 pounds for the semi-Keebra process.

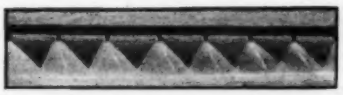
Increasing attention is being paid by pulp manufacturers to the possibilities of cooking with sodium monosulphite as in the Keebra process. The resulting pulp is nearly as white as ordinary unbleached sulphite and considerably stronger so that the paper made from it is harder, stronger and has a great resistance to folding and tear.

As applied to the pulping of esparto the Keebra process is said to give a much higher yield of pulp, as much as 20 per cent over the soda process and 9 per cent over the semi-Keebra process. Another advantage of the process is the absence of corrosion of equipment.

"Embossing" Explained in a New Book

Modern machinery and methods responsible for the remarkable results being obtained by embossing are fully and interestingly explained in a new book issued by The John Waldron Corporation, of New Brunswick, N. J. It is actually a textbook on the art of Embossing, clearly explaining principles, practices and problems—profusely illustrated with diagrams and photographs of the types of machines being used to speed up production and improve quality of products in the paper converting, textile and other industries. The book is attractively bound with an embossed cover that provides an imitation leather effect and it will be sent to any executive without obligation if requested on business stationery. Address John Waldron Corporation, New Brunswick, N. J., or their nearest branch office, 549 W. Washington Blvd., Chicago, and 30 E. 42nd Street, New York.

At a meeting of the Board of Directors of the Kalbfleisch Corporation, New York City, the following additions to the executive staff were announced: P. M. Dinkins, vice-president; J. F. Fredricksson, vice-president, and W. H. Neidhardt, assistant treasurer.



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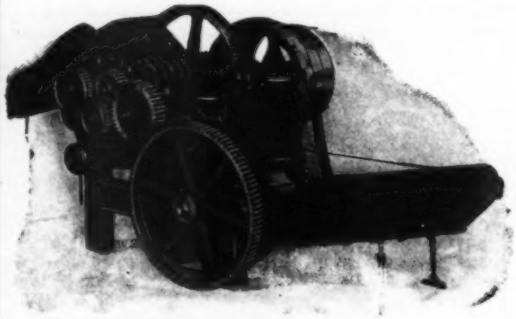
are evident from the fact that most of the first of these machines, built 25 to 30 years ago, are still doing daily service in paper mills. Of course, the Cutters we are now building are much heavier and stronger than these old machines, and have been improved in many ways, but the general principles and form have been retained.



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CUTS THE STOCK BOTH WAYS
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Durability, resistance to heat, and attractive appearance are other qualities of BITUMASTIC SOLUTION which, combined with the economy it affords, make it the most suitable paint for use in paper mills.

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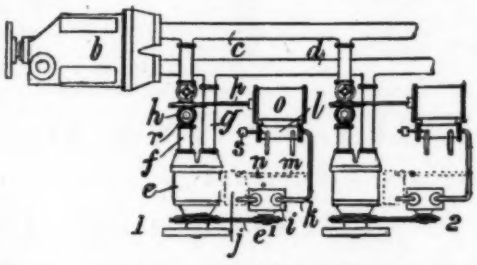
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Hydraulic Drives for Paper Machines

THE hydraulic drive for paper machines, which is seen in the accompanying illustration and which is patented in German Patent, No. 426,609, is based on the use of different motors for driving different parts of the machine, the speed of these motors being proportional to the production of the latter. The inlet valve (h), which controls the flow of water

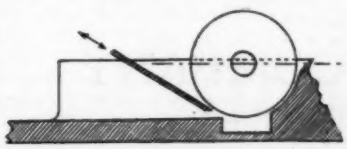


to the motor (e), driving a certain part of the paper making machine, is controlled by means of a piston which works in a cylinder (o) and controls the flow of liquid under pressure to the motor by means of another regulating valve seen at (l). The connection (k) between the auxiliary pump (i) and the regulating valve (l) is joined with the tube (m) and a regulating valve (n). In this way, the liquid pressure which acts on one end of the regulating valve (l) is changed. The return of the double piston of the regulating valve (l) is accomplished by means of a weight (s) and a spring arrangement.

Beater Construction

IT IS very seldom that a machine is found that is used to such a universal extent in the paper industry, as the beater and which has formed the subject of so many experiments both by practical men and others. A good deal of this work has been without any beneficial results at all. These experiments have developed nothing very new in the way of explaining the theory of the beating operation, and it is not strange to find beaters in paper mills which are operating at the very lowest kind of efficiency.

Thus in Zellstoff und Papier, 1926, page 32, the author describes an experience in a certain paper mill where a beater was operating at very low efficiency and with considerable consumption of power. Examination of the beater showed

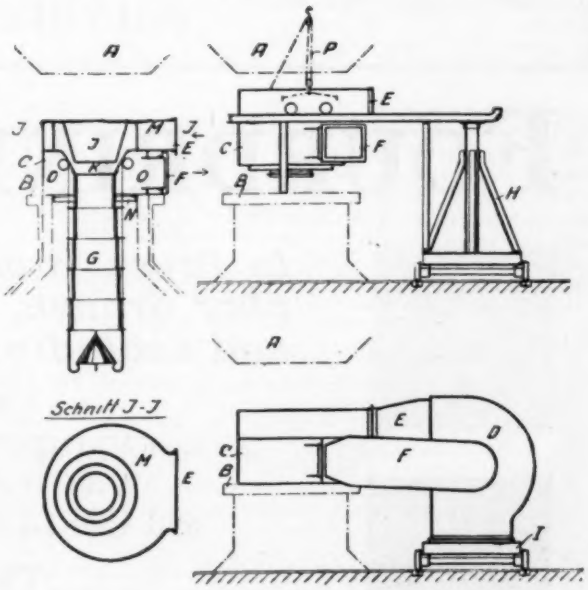


that it was constructed in a very inaccurate manner, and that the high power consumption was due entirely to this wrong construction. The manner in which the beater was made is shown in the accompanying figure and this also indicates how the imperfections in the design were counteracted. The stationary board which is shown inclined at a suitable angle to the beater roll had the effect of allowing only so much stock come in contact with the roll that it could easily handle. After this slight change was made, the beater operated very much more effectively and the power consumption was considerably lower. The production of pulp and the quality of the paper were both materially enhanced. This instance is of value in indicating how important it is to see that the beater is properly constructed in order for good results to be obtained.

Filling Digesters

THE method that is used to fill digesters is of interest to the practical pulp maker. Usually the method employed consists in cooking the wood, which does not only allow the introduction of a greater quantity of wood than the digester could otherwise handle, but it also has the advantage of driving the air and steam through the pores of the wood, which is done in such a manner that the wood, while being simultaneously heated, is also being put in a condition easily to absorb the digestion fluid.

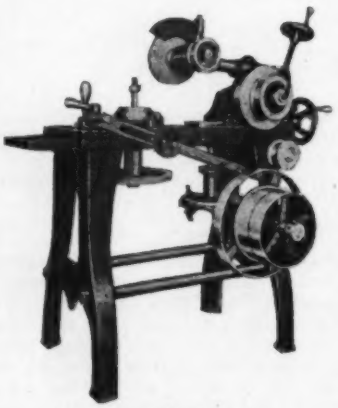
In a number of cases, the Fresk method of charging the digester may be employed to advantage along with cooking the wood. The operations which form this method are carried out at the moment that the chips are placed in the digester. The apparatus which is employed in the process is seen in the accompanying illustration. (C) is an apparatus which is shaped in the form of an injector which is introduced between



(A) and (B), at the moment that charging takes place. It can be moved and so can be used on all the digesters in the plant. (A) is the lower part of a bin which holds the wood chips. (D) is a blower which is connected with the apparatus (C) by means of the pipes (E) and (F). Both the blower and its driving motor are mounted on a truck. (G) is a pipe which is provided at its lower end with an arrangement which assures the proper disposition of the wood chips in the digester.

After the pipe in question has been properly fixed in the neck of the digester, the apparatus (C) is joined to, which can be easily done by means of two small block and tackle which are fastened to the storage bin. The truck is then placed in position and the fan is connected by means of the pipes (E) and (G) to the apparatus (C). The motor is then

Most Every Paper Mill Has Koegel Equipment



THE STANDARD
Capacity—8½-inch Diam. Slitters

Specifications: Floor space, 27"x 42"; speed of spindle, 55 revolutions; driving pulley, 9"x2½"—speed, 400 revolutions; emery wheel, 7"x½"—speed, 3,000 revolutions; weight, about 425 lbs.

Over 800

Standard Koegel Patent Universal Slitter and Circular Knife Grinders are in the paper and pulp mills of the United States and Canada. What greater evidence could be offered for the universal service this grinder renders?

For Greater Capacity

The Koegel No. 4 Patent Universal Slitter and Circular Knife Grinder is built for Slitters up to 16" in diameter. In mills where larger diameter knives and slitters are used, 150 are in service.

Here are the specifications: Floor space, 32"x52"; speed of spindle, 55 revolutions; driving pulley, 10"x2½"—speed, 400 revolutions; emery wheel, 8"x½"—speed, 3,000 revolutions; weight, about 525 lbs.

THE KOEGEL No. 4
Capacity—16-inch Diam. Slitters

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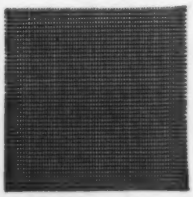

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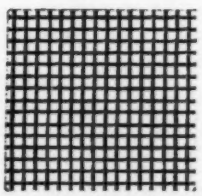

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set into operation and the wood chips commence to flow down in the storage bin.

The chips fall into the funnel (J) and meet the air which is coming out of the fan through the pipe (E) and the distribution chamber (M). They are thus thrown with great speed into the pipe (G), and due to the cone shaped device which is fixed to the bottom of that tube the chips are evenly distributed in the digester.

When the mixture of air and wood chips has left the pipe (G), the air separates a little from the wood, rises, passes through (N) and returns to the fan by the pipe (F). The hot air of the digester is thus maintained in constant circulation.

When the digester has been filled with the wood chips, the storage bin is closed, the truck with the fan and motor is moved away and the injector (C) is lifted with the aid of the pulley (P). The pipe (G) is removed and placed on the truck (H).

The pressure of the air that is fed into the digester from the fan is regulated by means of a valve which is arranged in the suction pipe. The regulation is effected in such a fashion that there is a vacuum of thirty to forty millimeters of water in the lower part of the digester, when the wood chips fall normally through the apparatus. The current of air enters the pipe (G) with a speed of sixty to eighty meters per second, while it leaves it at a speed of one to two meters near the top of the digester.

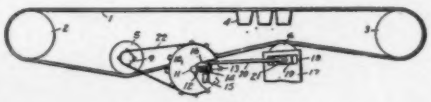
For further details on this interesting method of filling digesters with wood chips, the reader is referred to the original article which appeared in Le Papier, 1925, page 995 ff.

System for Boiling Cellulose

IN REGENERATING the waste heat and gases (sulphur dioxide) from sulphite cellulose boilers by blowing the gases into fresh sulphite liquor, undesirable back pressure effects are avoided by means of a system of injectors, pumps and valves. The gases are drawn from the boilers by pumping sulphite liquor through injectors, the vacuum chambers of which are connected to the tops of the digesters. The liquor then passes through a further pump and check valve into a storage tank. The liquor may be withdrawn from the bottom of the vessel for further circulation, or fresh liquor may be used continuously. British Patent, No. 239,191.

Paper Making Machine

THE paper making machine, which is described in United States Patent No. 1,582,583, combines with stationary suction boxes and an endless wire mesh, the upper ply of which travels over said boxes. There are also means which



are driven by the lower ply to impart a continuous slow angular swinging movement to the said lower ply, whereby the upper ply is caused to reciprocate laterally in its longitudinal travel over the boxes.

Bleaching Paper Stock

IN THE treatment of cellulosic material containing lignin of a siliceous character, for use in the manufacture of paper, the material is first treated at a relatively low temperature with bleaching powder and sodium bicarbonate in the presence of water. A preliminary treatment with an organic acid such as benzoic acid may be applied, and also a final treatment with a fixing agent, such as alum or lime salt to prevent subsequent discoloration. Mechanical wood pulp may be treated in this manner. The process can be carried out in a beater. British Patent, No. 248,118.

Making Pulp

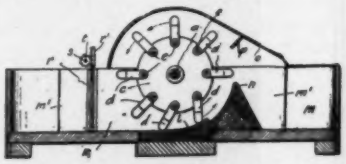
IN UNITED STATES Patent, No. 1,581,671, there is described a process for the manufacture of pulp from wood in which the wood is subjected to a preliminary treatment with a hot aqueous liquor of acidic properties in order to break down and convert a part of the normally water-insoluble wood ingredients into fermentable sugars without cooking the wood or injuring the pulping properties of the same. The fermentable sugars are then separated and thereafter the wood itself is converted into pulp.

Paper Making Process

THE moist sheet or web is partly dried by blowing steam into or through it while supported by wire gauge or other suitable porous material. Water is mechanically expelled and the web is heated ready for further drying operations. The steam may be supplied from a box contained in part of the suction roller drawing the web from the pulp vat. British Patent, No. 246,048.

Beater

THE beater, which is seen in the accompanying illustration, has a rotating member which is provided with a hinged beater element which is free to be extended radially by centrifugal force. There is also an anvil surface (n) which is arranged to intersect a segment of the path described by the extremity of the beater element, shown at (d), when radially extended. Thus during each revolution of the rotor, the beater element will first deliver a blow on the material spread on the anvil surface with the result that the fibrous masses will be bruised or cut, and the beater element will then drag over the anvil surface so as to remove the loosened fibers. This apparatus is patented in United States Patent, No. 1,581,464.



Cellulose Production with Aid of Chlorine

SODIUM hydroxide and chlorine are used for the production of cellulose from vegetable materials, such as grasses, which contain but little lignin. The use of chlorine has the disadvantage that hydrochloric acid is formed, which may damage the fibers. When gaseous chlorine is used, the dissolution of the hydrochloric acid causes a rise in the temperature and the process is less under control than when aqueous chlorine is employed.

It is preferable to remove most of the lignin by treatment with sodium hypochlorite. Only a minimum quantity of free chlorine is then required in the process. A vigorous chlorine treatment also leads to a considerable loss in weight. Paper which is made from esparto cellulose produced by a severe chlorination has the properties of an ordinary chemical pulp paper, rather than those of a good esparto paper. The use of sodium hydroxide and chlorine is economical if these can be obtained by the electrolysis of sodium chloride, using cheap water power. For further details on this interesting subject, see Papierfabrikant, volume 23, pages 759-61.

Bleaching Wood Celluloses

HYPOCHLOROUS acid oxidizes more rapidly than does hypochlorite ion and stringly hydrolyzed hypochlorites, such as those of zinc and aluminum, are therefore more active than calcium hypochlorite. When cellulose is bleached in a beater at a temperature of 35 degrees C. the product obtained with sodium hypochlorite has a lower ash content and copper number and a higher proportion of alpha cellulose than that obtained with magnesium, and especially with calcium hypochlorite. The hydrate copper number is higher, which may be due to a greater swelling power of the sodium salt.

It is possible that the impurities dissolve more readily as sodium than as calcium salts. The pentosan content is nearly the same in each case. Neutral salt may be expected to have an adverse effect on bleaching by diminishing the solubility of impurities. Cellulose bleached with a bleaching powder containing 34.6 per cent of active chlorine and 2.4 per cent of chloride chlorine is whiter than when bleached with a powder containing 25.4 per cent active chlorine and 9.2 per cent of chloride chlorine.

The white produced by sodium hypochlorite is adversely affected by additions of sodium chloride, sodium hydrogen carbonate, aluminum sulphate or magnesium chloride. The addition of calcium carbonate to the bleaching powder used results in a higher copper number and pentosan content. When cellulose is bleached with sodium hypochlorite the active chlorine diminishes less rapidly than when the calcium salt is

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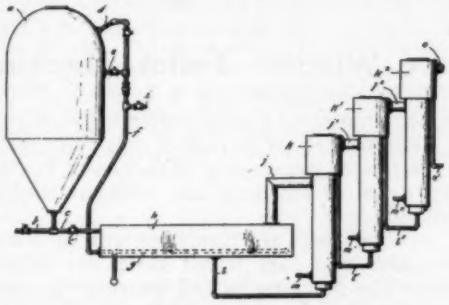
employed. The addition of sodium carbonate to sodium hypochlorite greatly decreases the rate at which it is reduced, whereas sodium hydrogen carbonate and sodium hydroxide have only a small effect. The rate is also diminished by sodium and aluminum sulphates and potassium chlorate and nitrate, and is increased by calcium chloride, magnesium sulphate and sodium acetate. Sodium and magnesium chlorides have but little effect. The addition of sodium acetate, and probably salts of other lower fatty acids, renders the bleaching inefficient.

Waste Sulphite Liquor Disposal

IN UNITED STATES Patent, No. 1,582,317, there is described a process and apparatus for the economical disposal of the waste sulphite liquor collected in the manufacture of sulphite pulp.

The process consists in concentrating the liquor by evapora-



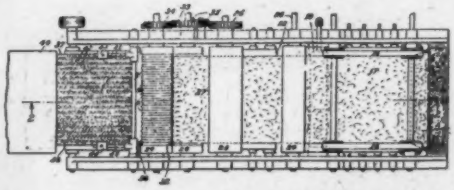
tion until it has attained a syrupy consistency, and them mixing this syrupy liquor with a porous readily combustible material which is heated to a higher degree than the liquor. In this way, expansion is first caused in this porous mass and partial expulsion of the gas in the pores of the combustible material. Then a partial vacuum is caused in the pores of the mass; in this manner saturation of the pores with the syrup is induced. The figure shows the apparatus in which this process is carried out.

Drying Paper

THE drying is assisted by blowing air from the outside into spaces enclosed between the frame of the machine, the web of paper or cardboard and the dryer felt. The air is introduced through nozzles, which may be alternately on either side of the machine, and passes at a high velocity through the defined spaces in such a manner and direction that it does not impinge on the paper web but acts rather as an ejector for the accumulated water vapor. British Patent, No. 223,927.

Paper Making

IN A process of forming longitudinally corrugated paper, the pulp is reduced to the condition of a moist web and the



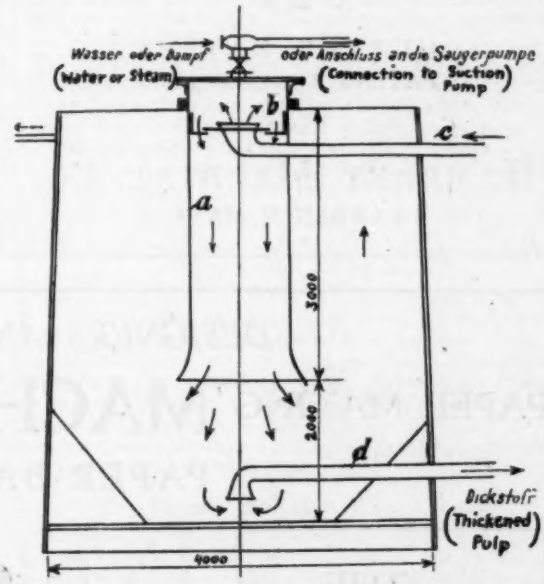
corrugations are rolled into the web while the latter retains sufficient moisture to stretch laterally as the corrugations are formed in it. The corrugated web is accordingly crinkled transversely throughout its corrugations while it still retains moisture. United States Patent, No. 1,582,838.

Removal of Printer's Ink from Paper

A NUMBER of experiments and the results obtained are discussed in an article published in Zeitschrift fuer angewandte Chemie, volume 38, pages 887-8, in the effort to remove the printer's ink that is found in old paper. The paper was first shredded in a suitable manner and then the shredded paper was shaken with a mixture of water and an organic liquid. Since cellulose is hydrophile and lampblack is hydrophobe a separation by flotation was to be expected. Trials were made with benzene, machine oil, carbon tetrachloride, and tetralin, the last named proving the most satisfactory. Better results were obtained by combining a physical and chemical method of separation. The paper was first boiled with an excess of dilute sodium hydroxide solution and then treated with the water and the tetralin.

A Filter for Waste Water

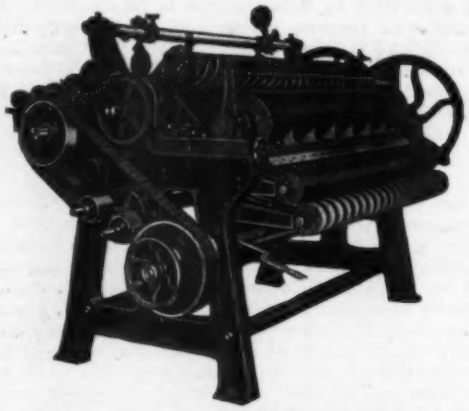
THE use of save-alls and filters on the paper and pulp mill is common practice. There are a great variety of these apparatus, and it is true that one form is more suitable for certain definite purposes than another. Those filters that depend on the settling of the fiber values have to contend with the difficulty of making such light masses as paper fibers sink to the bottom of the apparatus. On the other hand, they behave very well in those plants where the paper fibers are weighted with fillers, for then these fibers in the waste waters sink without much trouble. The funnel shaped save-alls are best suited for this purpose. Nevertheless there will be found many paper mills which have not as yet made use of this type of apparatus. One reason for this has been that their size and space requirements have been necessarily large. Then again the form of this apparatus is not such as to make its fabrication out of cement an easy matter. They are generally



from nine to eleven meters high and introduce costs which the small paper mill cannot very well stand.

In Zellsoff und Papier, 1926, pages 159-160, there is contained a description of a save-all that was designed by a paper man in a Jugoslavian paper mill. The apparatus is shown in the accompanying illustration. It is claimed that this type of save-all is about two-thirds as cheap as the one made from concrete. Then again the save-all is not as high as those usually employed, but at the same time it acts just as efficiently as the funnel shaped apparatus. The advantage is that it does not occupy as much space.

The apparatus consists of a wooden tank, four meters in diameter and 5.2 meters high, and this tank has sufficient capacity for the clarification of approximately fifty cubic meters of waste water per hour. A copper tube is arranged in the center of the tank, and this tube opens out at a point about two meters above the bottom. The pipe is fastened by means of two boards which are fixed to the bottom of the tank as well. In order to prevent the collection of dirt in the corners of the tank, boards are placed obliquely along all four sides, as may be seen from the figure, and these boards are covered with sheet copper. Above the tube (a) and somewhat above the highest level of liquid in the tank a circular screen (b) is arranged. This screen is suitably fastened to the



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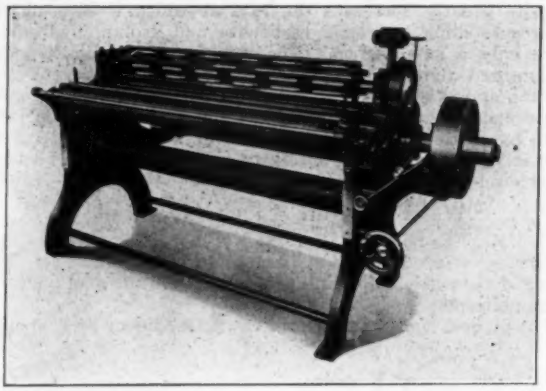

Drum Winder Toilet Machine

THIS machine winds a hard roll. The winding shaft rotates between two drums. The slitters are located in one drum. Various lengths of collars can be furnished for the slitter drum to accommodate different lengths of rolls desired.

Two core shafts are furnished with each machine, also two back stand shafts for Jumbo Rolls. The machine is ball bearing throughout, including the drive pulley.

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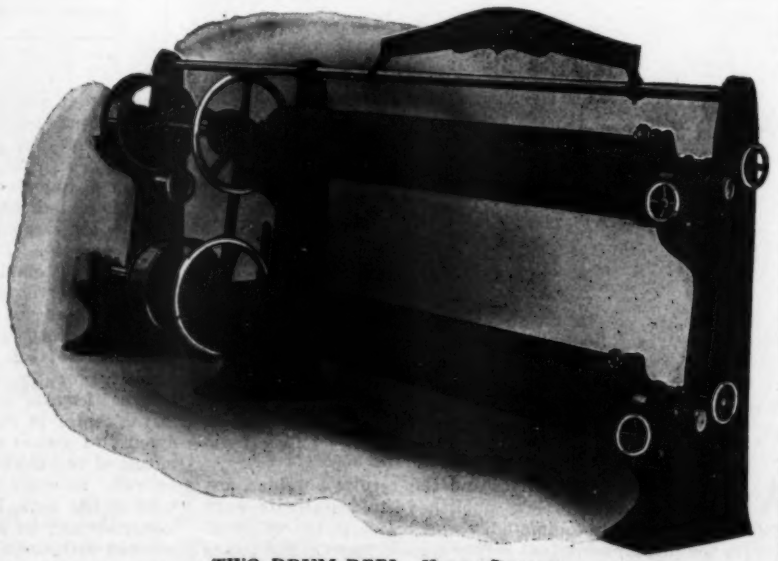


TWO DRUM REEL—Heavy Pattern

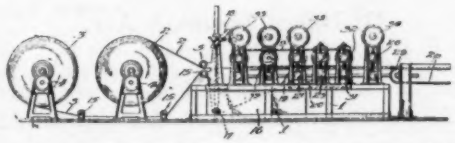
tube (a), as seen, whose diameter must be smaller than that of the tube (a), so that the waste waters may flow unimpeded into the apparatus.

A pump is employed to pump the waste waters into the save-all through the pipe (c) in such a manner that the direction of the water flow is upwards. The copper tube (a) is open at the top. If however scum forms above the screen (b), then the tube (a) can also be closed by means of a screen which is fastened to it by means of suitable flanges, and the excess air can then be sucked off by means of a suitable air suction pump. The discharge of the waters from the save-all must be effected in a continuous manner through the pipe (d), and this is best accomplished by means of a pump. The water can then be used either in the paper making machine or in the beaters. The size of the apparatus must be proportioned in accordance with the quantity of waters that has to be handled hourly.

This apparatus can be used not only for the clarification of paper machine back waters but also as a settling tank for sulphite liquors. The liquor, which runs to the tower, is frequently contaminated with particles of limestone from which it has been made. If this contaminated liquor is allowed to settle in this apparatus, then a very fine clear liquor is obtained. However, when the apparatus is being employed for this purpose, it is necessary to turn the mouth of the tube (c) downwards, and the liquor is allowed to flow into the apparatus through this tube.

Corrugated Board Apparatus

UNITED STATES Patent No. 1,582,579 is concerned with a process and apparatus for the manufacture of corrugated board. The machine used for this purpose comprises



corrugating rolls and means of making a series of spaced incisions in the sheet of board. A continuous belt with transversely extending bars is also provided for making connection with the corrugations. Means are also present for coating a plain surface sheet with an adhesive and for fixedly uniting the coated sheet with the corrugated sheet in order to form a unitary structure.

Chemical Activity of Cellulose and Its Significance in Sizing Paper

CELLULOSE is amphoteric in character. Thus, if it is immersed in dilute acid, hydrogen ions are taken up and hydroxyl ions are formed, and the converse takes place in an alkaline medium. The isoelectric point is somewhat on the acid side of neutrality. When sulphite cellulose is steeped in a 0.015 normal solution of sulphuric acid, washed thoroughly, and immersed in water, the amount of alkali present that is required to bring the pH value of the water to eight is several times as great as when the cellulose has not been previously immersed in acid.

This is not due to retention of sulphuric acid, because no sulphate can be found in the alkaline solution, and it is ascribed to the combination of cellulose with the hydrogen ions. This shifts the isoelectric point towards the acid side. With sulphate cellulose the effect is smaller and immersion in alkali has the reverse effect. The sulphate ions, corresponding to the hydrions taken up from sulphuric acid, remain in the solution as free ions.

Thus, if a trace of sulphuric acid is added to water, and this shaken with sulphate-cellulose, the pH of the water, determined electrometrically with a hydrogen or quinhydrone electrode, is less than that determined colorimetrically. If the water is made alkaline the electrometric method gives the higher pH. Size particles are electro-negative and, by making the cellulose positive by absorption of hydrogen ions from an acid solution, combination can be made to take place without alum, but this is not a practical process. When alum is used aluminum is absorbed and the cellulose becomes electro-positive. This is enhanced by washing with acid water, and the size then readily combines and is fixed in the fiber. Papierfabrikant, volume 23, pages 725-7, 745-8, 800-802 and 813-6.

Clarifying Sulphite Waste Liquors

IN GERMAN Patent, No. 422,328, there is described a process for the clarification of waste sulphite cellulose liquors. The process is based on a series of experiments that were carried out with the addition of hydrogenated naphthalene to the liquors, the former being used in a solution which has been acidified with hydrochloric acid. It was found that when this was done, the color of the waste liquor was quickly removed, and the yellow product that was secured in this manner was found to be a very valuable adhesive agent amongst other things.

For example, one hundred parts of the sulphite cellulose liquor of 36 to 38 degrees Be concentration were mixed with ten parts of a very thorough mixture of ten parts of tetrahydronaphthalene (tetralin) and five parts of hydrochloric acid. This mixture was made with constant stirring. The brownish color of the waste sulphite liquor was thereby quickly changed into a yellowish shade. This process can be carried out with just as good results in the cold as at an elevated temperature. The process can also be carried out in such a fashion that certain of the ingredients that are to be added are admixed with it, and then the other ingredient may be added while stirring.

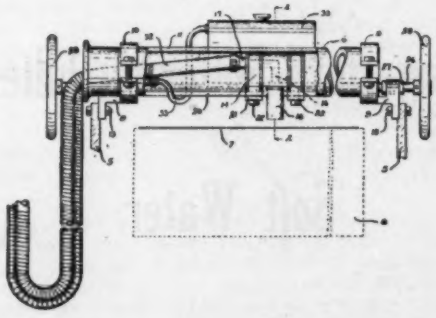
The proportions that have been given above for the tetrahydronaphthalene and the hydrochloric acid can be decreased or increased as the case may be, so that either a complete solution or only an emulsion-like mixture is obtained. It is also possible to vary the shade of the decolorized material by controlling the quantity of decolorizing agent that is added to the sulphite liquor. The sulphite waste liquor, which is treated in this manner, can be first either concentrated or diluted.

Analysis of Rosin Size

THE total rosin in the rose size is determined by precipitating a sample of the latter with dilute sulphuric acid and then the precipitate is collected on a tarred filter paper. The filter and the precipitate are then dried at a temperature of 105 degrees C. and are then weighed. Filtering the precipitate has the advantage over extracting it with either that substances, which contribute to the sizing effect, such as casein and starch, are included. For further details on this subject, see Papierfabrikant, 1926, page 125.

Fourdrinier Felt and Wire Cleaner

THE cleaning device for Fourdrinier paper wire screen and felts, which is patented in United States Patent, No. 1,582,186 comprises a frame portion which is attachable to a paper



making machine over the Fourdrinier wire. There is an elongated tubular housing, which is carried by the frame portion, a carriage which is adjacent to the housing, a discharge nozzle connected to the latter and a fluid conducting tube which is joined to the nozzle. Means are also provided for moving the carriage along the housing and also transversely with respect to the Fourdrinier wire.

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New York, June 1, 1926.

BUSINESS in paper is on a fair scale, generally speaking, yet there is a good deal of complaint registered over the prevailing market condition. It would appear as if the average paper manufacturer is experiencing moderate activity in his product, that a great majority of mills are managing to keep passably busy, and that the aggregate movement of paper into consuming channels is at least up to normal, but there seems to be little profit for paper manufacturers under prevailing market circumstances—at any rate one can judge that most paper producers are not realizing the return from their operations that they feel they should.

This situation, it appears, harkens back to the seemingly time-worn factor of over-capacity. Production of paper at present is not too large, from all indications, which is to say manufacturers purposely and wisely are endeavoring to keep their output down to within reasonable scope of the prevailing demand, yet in spite of the fairly good demand existing for most kinds of paper there is not sufficient business to go around and keep all mills running at capacity, with the result there is keen competition to secure as much of the business as is to be obtained, some price-shading and a rather unsatisfactory market condition from the angle of the margin of gain being realized.

Demand is somewhat spotty. There is an excellent call for supplies of newsprint and for some other classes of paper whereas certain kinds of paper are in noticeably limited demand. In other words, there isn't that generally good movement of supplies from mills into consuming channels that usually is noted in times when general business is active. The country is still suffering from a mild business depression; while on the surface and judging from statistics business is good, as a matter of cold fact it is not all that it appears to be—there isn't the volume to the demand for many commodities or as large a retail movement of merchandise as characterizes busier periods in the commercial cycle.

Obviously, paper being dependent on the situation ruling in so many other lines of business, the demand for paper reflects the quietness in numerous consuming fields. Consumers and converters are buying cautiously, seldom ordering other than to cover direct requirements. Having learned through recent experience they can secure prompt deliveries, and presumably realizing that paper mills are anxious for orders, consumers are buying as their needs develop and show practically no disposition to anticipate wants. This means, of course, many orders call for small lots, and in some branches of the paper trade the small-lot buying is being done to an extreme which in itself eliminates much of the profit which manufacturers figure on and rightfully are entitled to.

Statistics go to show that paper is being produced and moved to consuming centers in heavy tonnage. Production of newsprint in April, for example, was large, running close to the tonnage produced in March which was a record month for newsprint manufacturers. Newsprint output in the United States in April amounted to 145,327 net tons, and shipments from mills to 144,600 tons, according to the monthly report of the News Print Service Bureau. Production in Canada was 151,739 tons and shipments 154,015 tons, making a total United States and Canadian production of 297,066 tons and shipments of 298,615 tons, compared with 300,003 tons made and 295,823 tons shipped in March. There were also 14,347 tons of newsprint made in Newfoundland and 1,005 tons in Mexico, so that the total North American production in April was 312,418 tons. The newsprint mills also made 377 tons of hanging paper in that month, 96 tons of which were produced in Canada. During April the U. S. mills operated at 98.3 per cent of rated capacity and the Canadian mills at 98.5 per cent. The U. S. mills made 560,885 tons of newsprint during the first four months of 1926, against 504,643 tons in the same time last year, and the Canadian mills produced 581,183 tons, contrasted with 492,945 tons last year, the combined production of the two countries being 14 per cent greater in the first four months of the current year than in the corresponding period a year ago. Stocks of newsprint at U. S. mills totaled 19,478 tons at the end of April and at Canadian mills 12,415 tons, making a combined total of 31,893 tons, which was equivalent to 2.7 days' average production.

The monthly statistical summary of the American Paper and Pulp Association and affiliated organizations put the total production of paper and board of all kinds in the United States during March at 599,719 net tons, representing an increase of 13 per cent over the 523,657 tons produced in February, following a 3 per cent drop in the latter month from the January output of 546,820 tons. All grades recorded a gain in production in March as compared with the preceding month. The report shows that total shipments of paper from mills in March aggregated 592,126 tons, against 524,034 tons in February, while mill stocks of all grades at the end of March amounted to 226,973 tons, contrasted with 220,548 tons at the end of February.

The monthly report compiled and issued by the Department of Commerce put the production of paper board of all kinds in the United States in March at 220,515 tons, against 191,804 tons in the preceding month and 192,413 tons in January, mills producing at 107 per cent of their rated capacity in March, compared with the same percentage of output in February. Orders received for board during March called for a total of 214,733 tons, compared with 178,076 tons in February, while unfilled orders held by mills at the end of March were for 102,362 tons of board, against 104,578 tons at the end of the preceding month. Shipments of board from mills in March totaled 216,857 tons, contrasted with 190,878 tons in February, and mill stocks of board of all kinds were 52,049 tons at the end of March, compared with 48,472 tons at the end of February.

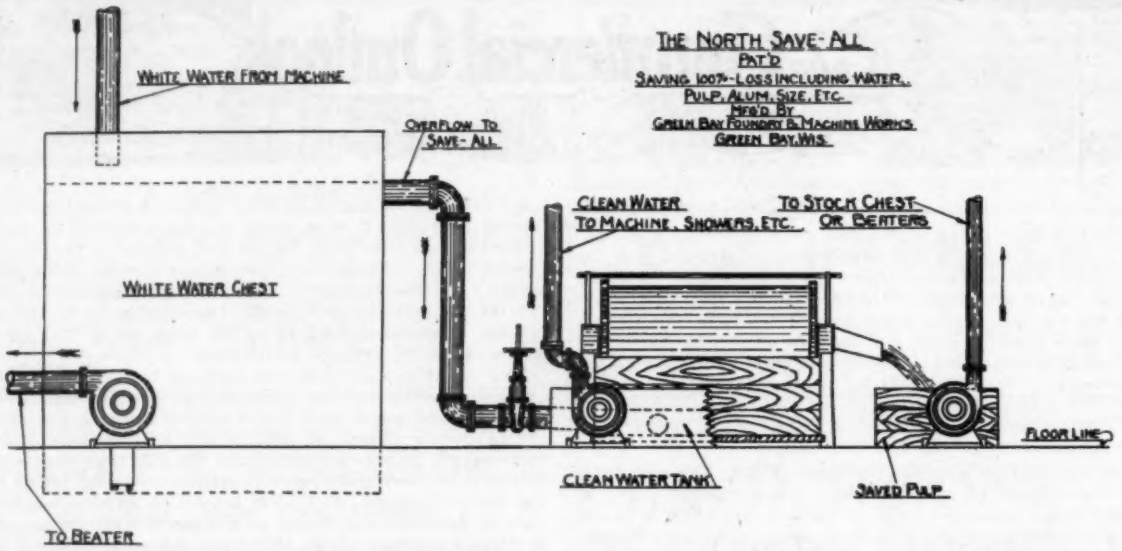
Newsprint is in steady movement from manufacturing centers to consumers. Publishers are printing large issues—it is nothing unusual for morning newspapers in New York to consist of 52 and 56 pages on weekdays or for afternoon dailies to have 48 pages and more. In fact, consumption is reported heavy all over the country. There is some talk in the trade anent the possibility of a further reduction in newsprint prices later this year, but it appears to be nothing more than trade gossip.

Coarse papers are in routine call and prices are none too firm although no definite changes have been announced. Fine paper is in fair demand only; consumers and jobbers alike are buying in small lots, and prices are quotably maintained. Book paper is moving freely into consuming channels, principally on contracts. New demand is rather limited.

The market for building papers has improved in recent weeks, reflecting the seasonal need of roofing felt and sheathing paper. Mills in nearly every case have increased their operations to take care of the expanding demand for these products.

Box boards are quiet. There is the usual routine demand but a majority of mills are running on curtailed schedules, and most orders are of small tonnage. Prices are down to $35 a ton delivered in New York for plain chip, and $37.50 for filled news board. Wall board is in better demand and quotably steady.

Announcement has just been made that The Timken Roller Bearing Co., Canton, Ohio, is to spend $1,500,000 in expanding their Canton plant. Building plans have been completed and the new units are to be ready by Jan. 1, 1927. The new construction program includes provision for enlarged laboratory and research facilities.



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The above layout on a ten-ton machine shows a profit of $103 per day with no pollution of streams and an efficiency of 98% in returned pulp. All of the eight paper machines in this mill are thus equipped. Alum cut down one third. Name of mill on application.

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See Page 349 in the 1925 Paper and Pulp Mill Catalogue

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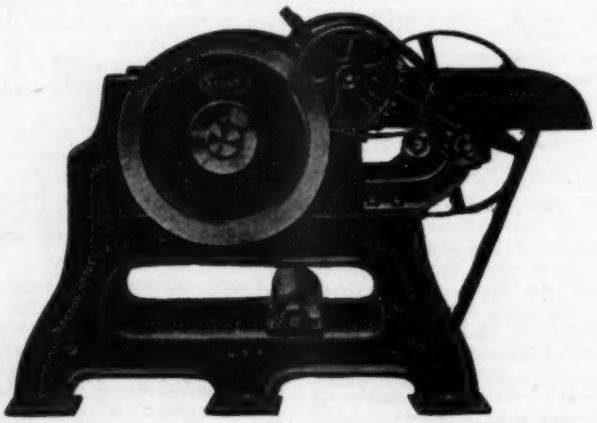

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Papermaking Rags

While a little more activity is to be noted in some spots, the market for papermaking rags generally continues quiet. Consumers in a great majority of cases are engaging in little buying other than to cover urgent requirements, and it would appear as if most paper mills have their needs so well taken care of by stocks on hand and supplies coming in against old orders that they can well afford to keep out of the market. Consequently the buying that is being done is of light volume, and in the aggregate does not begin to approximate normal at this time of the year.

Technically, the situation shows little change. It is doubtless true that, as dealers contend, the production and collection of rags in this country have fallen off in recent months, due to quietness in the clothing manufacturing trades leading to a reduction in the output of cloth cuttings, and to lower prices for old rags resulting in curtailed collections. However, this condition has been offset in considerable measure by less consumption on the part of paper mills. It cannot be denied a larger proportion of wood pulp than rag stock has been used by writing paper manufacturers for some months past; also importations of rags from Europe and from various other sources into the United States have been heavy, thus squaring up the reduced supply which has come into the market from domestic sources.

There seems little or no likelihood of a real scarcity of any class of papermaking rags developing in the near future. There are large stocks in this country, some in the hands of mills and some owned by dealers and importers. It may be certain grades may stiffen in price when demand revives because market levels have sunk to where doubtless there is scant profit for dealers. In fact, this situation has arisen to a minor degree during the last fortnight in roofing stock—the cheapest grade of rags for papermaking. Mills have shown a little better buying interest in roofing rags, and merely on the basis of a few fair-sized orders prices have strengthened slightly. No. 1 roofing stock of domestic origin has sold to felt paper mills at 1.60 cents per pound f. o. b. dealers' shipping points, recording a rise of about $3 a ton, while No. 2 packing has brought 1.30 cents at shipping points, an advance of approximately $2 per ton.

New cuttings are in slack demand. Occasionally consumers come into view as buyers on a narrow scale but orders are confined to small lots and principally to a few grades. The production of cuttings is low, according to representative dealers, but this has no great effect on the market situation when demand is proportionately light. Some grades, it is said, are well nigh unobtainable except in small parcels; others which are in better supply are more or less neglected by consumers. Dealers quote No. 1 white shirt cuttings at 12.50 cents a pound at shipping points, with some shading of this price reported. Fancy shirt cuttings are quoted at 7 cents, white lawns at 11.75 cents, light silesias at 9.25 cents, washables at 5.50 cents, blue overall cuttings at 8.75 cents, and unbleached muslin cuttings at 12.25 cents.

Old white rags have sagged a bit further in value to where No. 1 repacked whites are quoted at around 6.75 cents a pound at shipping points, and No. 2 repacked at 3.75 cents. Repacked thirds and blues are offered to paper mills at 2.75 to 3 cents per pound at dealers' points, and rough packing at 1.75 to 2 cents.

In foreign rags, chief activity involves roofing mill grades. There has been an expansion of buying interest in dark colored cottons and sales to mills at 1.40 cents and higher ex dock New York for forward shipment from abroad have been reported, while linsey garments have brought 1.65 cents ex dock. Importers are taking a stronger view of the market for these grades and are holding stocks on spot in this country with increased firmness. Linens are in slow demand, and the better qualities of old cottons are almost entirely neglected by consumers, reports stating that it is next to impossible to sell imported blue cottons and similar grades to paper mills at present almost regardless of the prices quoted.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	12.25-12.50
White shirt cuttings, No. 2	9.00- 9.25
Fancy shirt cuttings	6.75- 7.00
Washables, No. 1	5.50- 5.75
Unbleached muslin	12.00-12.25
White lawns	11.50-11.75
Overall cuttings, blue	8.50- 8.75
Black silesias	4.25- 4.50
Light flannelettes	10.00-10.25
Canton flannels, bleached	10.75-11.00
Canton flannels, unbleached	10.50-10.75
Shoe cuttings, bleached	11.75-12.00
Shoe cuttings, unbleached	10.75-11.00
Light silesias	9.00- 9.25
O. D. khaki cuttings	6.50- 6.75
Mixed khaki cuttings	5.50- 5.75
Corduroy cuttings	4.25- 4.50
Cottonade cuttings	4.00- 4.25
Linens, No. 1 white, foreign	13.50-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	6.50- 7.00
Whites, No. 2 repacked	3.50- 4.00
Whites, house soiled	2.25- 2.50
Whites, street soiled	2.00- 2.25
Lace curtains	6.25- 6.50
Thirds and blues, rough	1.75- 2.00
Thirds and blues, repacked	2.75- 3.00
Black stockings	4.00- 4.25
Cotton canvas, No. 1	5.50- 5.75
White cotton batting	3.75- 4.00
Roofing, No. 1	1.60- 1.70
Roofing, No. 2	1.30- 1.40
Linsey garments, foreign	1.60- 1.70
Dark colored cottons, foreign	1.40- 1.50
Blue linens, foreign	4.00- 4.25
Gray linens, foreign	4.25- 4.50
White linens, foreign	8.00- 8.50
Light prints, extra, foreign	1.75- 2.00

Rope and Bagging

Both old rope and bagging are meeting with a fairly ready sale to paper mills yet most buyers are exerting caution in absorbing supplies and are placing orders only to satisfy direct needs. There has been no important change in prices. Old rope of domestic origin is a bit lower despite a steady movement into consuming channels, current prices ranging from 5.50 to 5.75 cents a pound at dealers' shipping points for No. 1 domestic old manila rope. Dealers assert that supplies coming in from production sources are unusually light and that there is no doubt an increase in demand would send values upward almost at once. Foreign old rope is neglected by most paper manufacturers and the ruling market price basis is about 4.75 cents a pound ex dock New York for No. 1 rope. Strings are in slow call and are reported available at 1.50 cents per pound at shipping points for mixed strings, and 2.25 cents for sisal strings.

The market for roofing bagging is looking up, with prices tending firmer. Dealers quote 1.20 cents or higher at shipping points for both domestic or foreign material. No. 1 scrap bagging is fetching 2.50 cents a pound to slightly higher for extra quality packing at dealers' points of shipment. Old gunny bagging is quoted at 3.75 to 4 cents a pound.

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F. o. b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	3.75-4.00
Gunny, No. 1 foreign	3.75-4.00
Scrap bagging, No. 1	2.50-2.75
Roofing bagging	1.20-1.30
Wool tares, heavy	3.75-4.00
Wool tares, light	3.50-3.75
Manila rope, No. 1 foreign	4.50-4.75
Manila rope, No. 1 domestic	5.50-5.75
Sisal strings	2.25-2.50
Mixed strings	1.50-1.75

Old Paper

The old paper market is dull and weak, there is not enough demand emanating from consuming quarters to have influence of a firming character on values, and the condition obtaining is, from many angles, unhealthy and uneconomic. There is no question but that tremendous quantities of waste paper are being destroyed at present because market prices are so low it does not warrant dealers to collect stock in normal volume, the condition having become so accentuated that numerous packers in New York and other large cities have reduced collections to a minimum. However, consuming mills cannot be blamed for this as, not needing larger supplies, they are not in a position to absorb bigger tonnage nor should they be expected to pay more than market prices to get what stock they require. It seems simply one of those periods for which the waste paper market is renowned, when supply exceeds demand and when prices go down nearly out of sight.

In the East old No. 1 mixed paper is selling to mills at 40 cents a hundred pounds f. o. b. New York, and possibly at slightly less in some cases, while old folded newspapers are available at 50 cents and less f. o. b. New York. In the Middle West higher prices obtain for these grades, dealers asking and receiving $2 to $3 a ton more. Shavings are quoted at around 3.50 cents per pound at shipping points for No. 1 hard white, and 2.65 cents for No. 1 soft white shavings. Heavy No. 1 book stock is quoted at 1.05 cents a pound upwards at dealers' points, ledger stock at 1.50 cents, old No. 1 kraft paper at 1.65 cents, and white blank news at 1.60 cents.

The following prices, f. o. b. shipping points, are somewhat nominal:

	New York and Chicago
Hard white shavings, No. 1	3.40-3.60
Hard white shavings, No. 2	3.00-3.25
Soft white shavings	2.50-2.75
Colored shavings	.90-1.00
Heavy book, No. 1	1.00-1.15
Crumpled book, No. 1	.75- .85
Ledger stock	1.50-1.75
Kraft, No. 1	1.65-1.80
Manilas, No. 1	.60- .75
White blank news	1.60-1.70
Overissue news, No. 1	.50- .65
Folded news	.45- .60
Sulphite mill wrappings	.70- .80
Mixed paper, No. 1	.35- .50
Common paper	.25- .35

Pulp Wood

The market for pulpwood is firm and demand is reported keeping up in consistent fashion. Pulp manufacturers are absorbing supplies freely both against contracts and on spot commitments, and prices are steady though on essentially unchanged levels.

Mechanical Pulp

This is the season of the year when mechanical pulp production is large, grinders being aided by plenty of water and therefore running their plants at close to maximum capacity. However, the increased output is largely offset by the heavy consumption by newsprint mills, and while the market tone is not as firm as it was up to recently there has been no important change in quotations. Prices may be a shade lower in some districts, and offerings of foreign ground wood on

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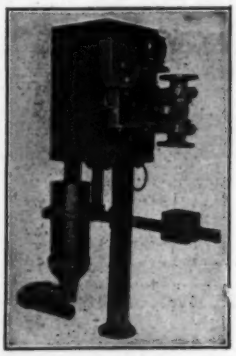

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TRIMBEY MACHINE WORKS

Glens Falls, N. Y.

the spot in this country at recessions have had some influence on domestic prices, but the market as a whole displays moderate firmness and comparatively good activity.

Domestic producers have little ground wood to sell, most of them needing all the pulp they are making, and prices range around $33 a ton f. o. b. shipping points for prime spruce ground wood. Grinders in Canada quote $30 a ton in a great majority of cases but it is stated some supply is available in far-off points in the Dominion at cheaper figures though the additional freight brings the cost at consuming centers up to the same level as pulp shipped from nearer points.

Production of mechanical pulp in the United States during March totaled 95,095 tons, compared with 86,778 tons in February and 96,173 tons in January, according to the monthly report of the American Paper and Pulp Association, while stocks at producing mills at the end of March amounted to 115,149 net tons, against 122,533 tons at the end of the preceding month. Shipments from domestic mills in March totaled 5,059 net tons.

Chemical Pulp

Offerings of imported pulps on the spot at New York or other American ports at price concessions have had a superficially weakening influence on the domestic chemical pulp market, yet quoted prices of domestic grades are maintained and the market exhibits little worthwhile change. Demand at present is slow; in fact, it is reported from some parts of the trade that business is virtually at a standstill, that consumers manifest little or no desire to buy, and that such sales as are transpiring involve unimportant parcels. There is, however, a good and steady movement of supplies against contracts and back orders, and it is understood producers are still fairly well fixed with commitments on file.

Leading manufacturers in the U. S. and Canada quote bleached sulphite at 4 to 4.25 cents a pound at pulp mills for the most popular grades, with finer brands priced up to 4.75 cents. No. 1 strong unbleached sulphite is quoted at 3 cents a pound to several dollars per ton higher, while No. 1 book sulphite is selling from 3.25 to 3.50 cents at pulp plants. No. 1 kraft is steady at about 3.25 cents or a little less at producing points, and bleached soda pulp is quoted at 3.75 to 4 cents per pound at points of shipment.

United States mills produced a total of 113,866 net tons of chemical pulp in March, contrasted with 101,497 tons in the preceding month and 105,438 tons in January, according to the monthly statistical review issued by the American Paper and Pulp Association in co-operation with the United States Pulp Producers' Association. Mill stocks of chemical pulp at the end of March amounted to 19,565 net tons, against 20,222 tons at the end of February and 19,910 tons at the end of January.

Quotations f. o. b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	3.25-3.50
Unbleached sulphite, No. 1 strong (news grade)	3.00-3.15
Unbleached sulphite, No. 1 book	3.25-3.50
Soda pulp, bleached	3.75-4.00
Mitscherlich, unbleached	3.25-3.50
Kraft, No. 1	3.00-3.25
Screenings, refined	1.60-1.80

Chemicals

The outstanding feature in the papermaking chemicals market is the strong position of casein. This commodity is high in price and has scored a further advance during the last month despite the recent sharp increases, the domestic product now being quoted at around 18 cents a pound and imported casein at 18.50 cents. Caustic soda is in fair demand and steady in price at 3.10 to 3.15 cents per pound f. o. b. works, while soda ash is quoted firmly at 1.38 cents in bags at works. Prices of bleaching powder are firm on a basis of 2 to 2.40 cents a pound in large drums f. o. b. works.

Average quotations are as follows:

Alum, lump ammonia	3.50- 3.75
Alum, lump starch	3.75- 4.00
Blanc fixe, powder	4.00- 4.25
Bleaching powder	2.00- 2.40

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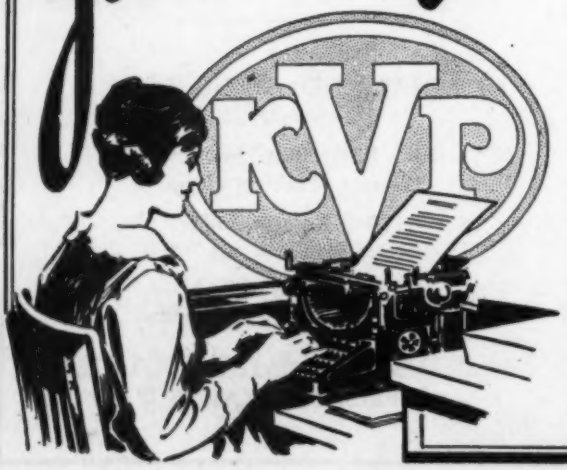

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We could occupy this entire page in telling you about the merits of K.V.P. Bond Paper and even then we would not run out of plenty of good, sound logical arguments in its favor.

We have been manufacturing Paper for many years, but we say to you frankly, that the best Paper we ever saw or heard of, for all printing purposes, is K.V.P. Bond.

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KALAMAZOO VEGETABLE PARCHMENT CO.
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New Papers

Writing—	
White rag	15-40
White sulphite	11-30
Colored rag	15-40
Colored sulphite	10-30
Ledger—	
White rag	16-40
White sulphite	12-30
Colored sulphite	11-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	9-30
Colored sulphite	9-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.50- 8.00
Machine finished	6.25- 8.00
English finished	6.25- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.50-15.00
Newsprint—	
Rolls, contract	3.25- ....
Rolls, transient	3.50- ....
Sheets	3.75- 4.00
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.80- .90
No. 2 white, 24x36	.75- .80
No. 1 manila, 24x36	.75- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	6.00- 6.50
No. 2 Kraft	5.00- 5.50
Boards— —	New York and Chicago
Solid news	40.00-45.00
Straw	50.00-55.00
Plain chip	35.00-37.50
White coated chip	50.00-55.00
Manila coated chip	45.00-50.00
Binder's board	70.00-75.00

Chemicals

(*Continued from page* 545)

Brimstone (long ton, at mine)	18.00-19.00
Casein (duty paid)	17.50-18.50
Caustic soda, spot delivery	3.10- 3.15
China clay, domestic washed	8.00-10.00
China clay, foreign	13.00-20.00
Rosin, grade E	11.00- ....
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38- ....
Starch, papermakers', in bags	3.32- ....
Talc (ton)	15.00-18.00

Dr. Hugh P. Baker, secretary of the American Paper and Pulp Association, who is a member of the board of directors of the Swedish Chamber of Commerce of the United States, was invited by the John Ericsson Memorial Commission to be present at the ceremonies attending the dedication of the memorial to John Ericsson, held at West Potomac Park, Washington, D. C., May 29.

National Stream Purification Committee

Indicative of the interest of the paper industry of the United States in the steps taken in many states for the purification of the streams, President Norman W. Wilson of the American Paper and Pulp Association has named a committee of manufacturers in many states as a National Stream Purification Committee for the Pulp and Paper Industry. The committee named is as follows:

Harry E. Fletcher, Chairman, Fletcher Paper Co., Alpena, Mich.; Felix Pagenstecher, Bryant Paper Co., Kalamazoo, Mich.; Ernst Mahler, Kimberly-Clark Co., Neenah, Wis.; Guy Waldo, Flambeau Paper Co., Park Falls, Wis.; C. M. Baker, Chief Engineer, State Board of Health of Wisconsin, Madison, Wis.; H. P. Carruth, Mead Pulp & Paper Co., Chillicothe, Ohio; Minor M. Beckett, Beckett Paper Co., Hamilton, Ohio; F. H. Waring, State Board of Health, Columbus, Ohio; Geo. K. Spence, N. Y. & Pa. Co., Johnsonburg, Pa.; F. P. Klund, Hammerhill Paper Co., Erie, Pa.; W. L. Stevenson, Chief Engineer, Sanitary Water Board of Pennsylvania, Harrisburg, Pa.; Geo. E. Williamson, Strathmore Paper Co., Mittineague, Mass.; S. B. Copeland, Eastern Mfg. Co., Bangor, Me.; Abel Wolman, Chief Engineer, Department of Health, State of Maryland, Baltimore, Md.; Edward D. Rich, Director, Bureau of Engineering, Michigan Dept. of Health, Lansing, Mich.; W. G. MacNaughton, Technical Association of the Pulp and Paper Industry, New York City.

In announcing the appointment of this committee, Dr. Hugh P. Baker, executive secretary of the association, explains the interest of the paper manufacturers in the problem of pure water by saying:

"In no other industry in the United States is so much water used in the manufacture of the product, as in paper. . . More than 7,000 gallons of chemically purified and filtered water must be available for the manufacture of every 100 pounds of paper. Many of the mills in the industry are seeking to prevent economic waste of raw materials, have put in equipment that has cut the amount of waste discharged in the streams to a minimum and have found the effort a profitable one.

"To co-ordinate studies of waste disposal in the industry and to co-operate effectively with state agencies working for the purification of rivers and streams, the industry has been seeking a means of more effective action both through the Technical Association of the Pulp and Paper Industry, and through scientific agencies outside the industry. We believe that the problem can be most effectively met through co-operation."

Import Committee Sends Representative Abroad

In pursuance of its original program to have men on both sides of the water to guard against the unfair importation into this country of foreign paper, the Import Committee of the American Paper Industry has engaged George R. Coxe to serve as its representative abroad. The original program of the committee contemplated the investigation of all questionable foreign importations, both through customs experts in this country, and through a representative abroad who might check unfair foreign competition at the source.

Mr. Coxe sailed on May 20th to take up his new work. He is thoroughly conversant with the problems before the committee, as well as with customs procedure, having spent several years in Europe as a member of the Customs Service. Warren B. Bullock, manager of the Import Committee, sailed with him to secure a first-hand knowledge of European conditions, and to assist in organizing this new form of the committee's work.

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"HAFSLUND BEAR"
Bleached Sulphite

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Bleached Sulphite

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Extra Strong Kraft

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Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
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BATHURST, NEW BRUNSWICK, CANADA

EXPORTS

Exports of paper and paper products from the United States, according to figures issued by the Paper Division of the Department of Commerce, registered further gains during the month of March, 1926, total shipments, which were valued at $2,349,941, exceeding those of the preceding month by 13 per cent and of the corresponding month in 1925 by 16 per cent. Nearly all classes of paper and board shared in this increase, losses being confined largely to shipments of toilet paper, sheathing and building paper, cigarette paper, paper bags and envelopes.

Exports of newsprint, book paper, writing and wrapping paper, all of which underwent a sharp decline during February, showed notable improvement in March, shipments of these lines exceeding the previous month's exports, and with the exception of book paper, those made in March, 1925. The outstanding gains, however, occurred in exports of box board, which were twice as large as those of the preceding month and six and one-half times as large as during the corresponding month last year. Exports of other classes of paper board and straw board, including bristol boards, were also larger, increasing approximately 20 per cent in comparison with shipments made in February last and in March, 1925, while exports of boxes and cartons showed an increase of 65 per cent and of wall boards an increase of 100 per cent in comparison with the corresponding month of 1925.

Exports of paper from the U. S. since the beginning of the current year have shown a fairly steady increase in comparison with the same period of last year. The total for the first quarter in 1926, amounting to $6,569,949 in value, exceeded that of the similar quarter in 1925 by 21 per cent. While shipments of a majority of the items were considerably larger than those made last year, the increase in the 1926 shipments was due principally to the greatly increased sales of boards, newsprint, writing, and surface-coated papers, and paper boxes, all of which rank among the leading paper exports. Shipments of book paper, however, which is also one of the leading items, failed to show any improvement, exports during the first quarter of 1926 showing a loss of 3 per cent in comparison with the same period in 1925. Exports of bags, another important item, were also slightly under those during the first three months of last year, although recording a small increase over the last quarter of 1925. The remaining losses were confined to toilet paper, envelopes, sheathing and building papers, and miscellaneous paper.

IMPORTS

Wood Pulp

A rather unique condition exists at present in the foreign wood pulp market. The tone of the market has turned distinctly easy during the last several weeks, that is to say, the price position of spot supplies in this country is weak, and as a result of the pressure to sell some lots of spot fibre and the almost total disappearance of demand, pulp of Scandinavian and other European origin is available in New York or other American Atlantic ports at by far cheaper prices than elsewhere throughout the world.

The situation now prevalent harkens back some months when paper manufacturers in the United States bought pulp heavily abroad for forward shipment in the spring. In recent weeks shipments have been coming into this country in large tonnage, and at least a slight surplus of supply has developed here. Some paper and board mills are now seeking to dispose of certain lots on the dock or in store, and there are supplies in importers' hands which are being offered rather promiscuously around the market, with the result that with very few buyers in sight, prices have eased to a pronounced degree. The markets abroad, from all accounts, rule firm. Scandinavian mills, being well sold up for the balance of this year, are not worried seemingly by the temporary condition of the market here and are maintaining quotations firmly. In Germany, Finland and Canada prices are steady quotably, and buyers seeking pulp for future delivery from any of these primary sources find it necessary to meet prices well above those at which spot stocks can be bought in New York and other Atlantic seaboard points.

Strong prime unbleached sulphite, which is quoted for forward shipment from abroad at 3.15 and 3.20 cents a pound, is reported offered on spot in New York at 3 cents and possibly at slightly less in exceptional cases. Prime Swedish kraft pulp is available on spot in this country at 3 cents ex dock New York whereas for forward shipment from the primary source 3.10 to 3.15 cents is quoted. Bleached sulphite has eased a bit further in price to where prime grades are reported available at 3.75 cents and in some instances at 3.65 cents ex dock New York. Foreign ground wood is down in price to where offerings of wet pulp have been recorded at $32 a ton ex dock New York, with dry available at $36 per ton.

Imports of wood pulp into the United States during March amounted to 88,403 long tons of all grades of chemical, valued at $5,964,039, compared with 89,374 tons of a value of $5,909,772 imported in February last, and 107,765 tons of a value of $6,632,021 in March, 1925. March imports brought the total for the first three months of this year up to 290,133 long tons of chemical pulp, giving a monthly average of 96,711 tons, contrasted with a monthly average of 109,354 tons in the corresponding period a year ago. Imports of mechanical pulp in March were 21,800 long tons, valued at $647,177, against 20,441 tons of a value of $588,527 in the preceding month, and 16,871 tons of a value of $496,149 in March, 1925. Ground wood imports during the first three months of this year totaled 64,909 tons, giving a monthly average of 21,636 tons, compared with an average of 20,513 tons imported in the same time of last year.

Current market quotations ex dock New York and receipts at the port of New York during May follow:

Bleached sulphite, No. 1	3.65- 4.00
Unbleached sulphite, strong, No. 1	2.90- 3.15
Unbleached sulphite, No. 2	2.75- 3.00
Easy bleaching sulphite	3.15- 3.40
Mitscherlich unbleached, genuine	3.25- 3.50
Mitscherlich unbleached, ordinary	2.90- 3.10
Kraft, standard Swedish	3.00- 3.20
Ground wood, per ton (dry)	36.00-38.00

Johaneson, Wales & Sparre, 1,070 bls. from Gothenburg and 1,250 Bremen; Parsons & Whittemore, 150 lbs. from Gothenburg; Buck, Kaier & Co., 800 bls. from Gothenburg and 5,828 Oslo; Price & Pierce, 4,920 bls. from Gothenburg; Scandinavian Pulp Agency, 3,138 bls. from Gothenburg; Central Union Trust Co., 800 bls. from Oslo and 1,704 Bremen; Bulkley, Dunton & Co., 1,320 bls. from Rotterdam, 1,350 Hamburg and 2,980 Bremen; French American Banking Corp., 850 bls. from Rotterdam; M. Gottesman & Co., 1,350 bls. from Rotterdam and 2,200 Sebenico; Tidewater Paper Mills Co., 12,290 bls. ground wood from Liverpool, N. S.; Pagel, Horton & Co., 1,800 bls. from Husum; Castle & Overton, 630 bls. from Antwerp and 180 Rotterdam; Chemical National Bank, 900 bls. from Oslo; Perkins-Goodwin Co., 250 bls. from Oslo; Chase National Bank, 2,000 bls. from Oslo; Lagerloef Trading Co., 433 bls. from Hango; J. Andersen & Co., 550 bls. from Hamburg, 135 Bremen, 2,394 Hafslund and 215 Gothenburg; Nil-

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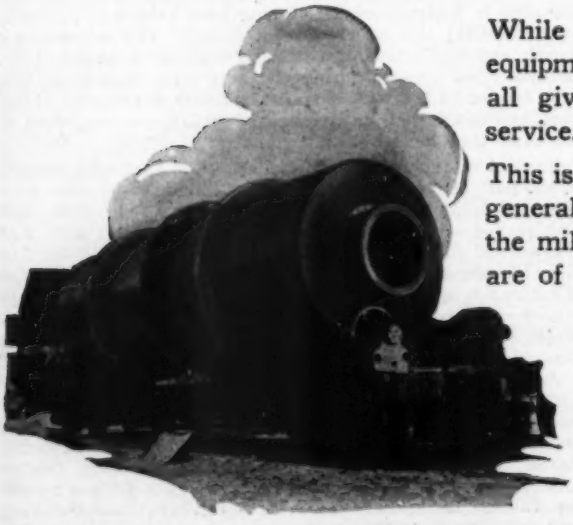

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MANITOWOC ENGINEERING WORKS, Manitowoc, Wis.

MANITOWOC

sen, Lyon & Co., 1,236 bls. from Bremen; A. P. W. Pulp & Power Co., 1,369 tons ground wood from Sheet Harbor; E. M. Sergeant Co., 730 bls. from Gothenburg and 470 Oslo; Banca Commerciale Trust Co., 1,382 bls. from Hamburg; National City Bank, 525 bls. from Hamburg; Borregaard Co., 2,400 bls. from Hafslund; H. Hollesen, Inc., 145 bls. from Hamburg; Durnet Co., 130 bls. from Rotterdam; Order, 3,219 bls. from Stockholm, 8,061 Hango, 9,023 Bremen, 3,780 Antwerp, 765 Hamburg, 2,450 Trieste, 300 Trondhjem, 275 Hafslund and 400 Oslo.

Paper Stock

Imports of most grades of paper stock other than wood pulp showed a falling off during May, judging from receipts through the port of New York. There were fewer rags imported, thus continuing the decline in rag importations thus far this year in comparison with the same period last year, and less miscellaneous paper stock also was imported. Arrivals of old rope were fairly large, while receipts of old bagging probably were a little larger than usual.

Imports of all kinds of papermaking material through the port of New York in May, with names of consignees, compiled from manifests of steamers reaching that port during the month, were as follows:

Old Rope

Brown Bros. & Co., 1,453 coils and 853 bls.; National City Bank, 81 bls.; Ellerman's Wilson Line, 279 coils; E. J. Keller Co., 46 coils; W. Schall & Co., 78 bls.; Irving Bank-Columbia Trust Co., 138 bls. and 29 coils; Montell & McDonough, 8 bls.; Marx Maier Paper Mill Supply Corp., 60 bls.; Evan & Banks, 6 bls.; Maurice O'Meara Co., 170 bls.; New York Trust Co., 114 coils; Union National Bank, 58 coils; Sterling Mill Supply Co., 82 bls.; Darmstadt, Scott & Courtney, 79 coils; Order, 492 coils and 64 bls.

Old Bagging

State Bank, 400 bls.; Manufacturers Trust Co., 1,200 bls.; Royal Manufacturing Co., 143 bls.; Chemical National Bank, 127 bls.; New England Waste Co., 423 bls.; Marx Maier Paper Mill Supply Corp., 642 bls.; D. I. Murphy, Inc., 36 bls.; Central National Bank, 141 bls.; New York Trust Co., 68 bls.; Weil Bros., 65 bls.; A. W. Fenton, Inc., 5 bls.; Stone Bros. Co., 40 bls.; Vacuum Co., 183 bls.; Fidelity International Trust Co., 33 bls.; Goschens & Cunliffe, 86 bls.; Irving Bank-Columbia Trust Co., 71 bls.; F. H. Von Damm, 150 bls.; J. Cohen, 41 bls.; Salomon Bros. & Co., 140 bls.; Bowery & East River National Bank, 40 bls.; National Bank of Commerce, 154 bls.; Seaboard National Bank, 118 bls.; Smart & Toch, 49 bls.; Brown Bros. & Co., 87 bls.; Katzenstein & Keene, 34 bls.; L. H. Abenheimer, 129 bls.; E. J. Keller Co., 66 bls.; Mechanics & Metals National Bank, 68 bls.; Rudolf Wolf, 16 bls.; Sterling Mill Supply Co., 205 bls.; Anglo-South American Trust Co., 65 bls.; National City Bank, 121 bls.; Order, 120 bls.

Rags

Stone Bros. Co., 122 bls.; Darmstadt, Scott & Courtney, 238 bls.; Salomon Bros. & Co., 85 bls.; Victor Galaup, Inc., 206 bls.; Sterling Mill Supply Co., 393 bls.; Maurice O'Meara Co., 10 bls.; Romeo, Camovari & Gigli, 17 bls.; Paul Berlowitz, 179 bls.; M. Kanarch, 18 bls.; Whaling Waste Products Co., 4 bls.; Robert Blank, 419 bls.; A. H. Searle, 8 bls.; William Steck & Co., 67 bls.; S. Birkenstein & Sons, 147 bls.; Daniel M. Hicks, Inc., 145 bls.; Fritz Stern, 148 bls.; American Wool Stock Co., 250 bls.; E. Butterworth & Co., 71 bls.; Jaffe Products Co., 80 bls.; S. Silberman Co., 4 bls.; Atlas Waste Mfg. Co., 386 bls.; A. C. Fetterolf, 33 bls.; Essbeekay Import and Export Co., 27 bls.; Marx Maier Paper Mill Supply Corp., 46 bls.; E. J. Keller Co., 202 bls.; George M. Graves Co., 50 bls.; Bulkley, Dunton & Co., 48 bls.; George W. Millar & Co., 58 bls.; Mechanics & Metals National Bank, 743 bls.; Equitable Trust Co., 353 bls.; National City Bank, 139 bls.; Chemical National Bank, 398 bls.; National Bank of Commerce, 618 bls.; Chase National Bank, 642 bls.; Bowery and East River National Bank, 1,063 bls.; Anglo-South American Trust Co., 200 bls.; State Bank, 642 bls.; Baltimore Trust Co., 11 bls.; Irving Bank-Columbia Trust Co., 74 bls.; Fidelity International Trust Co., 60 bls.; Goschens & Cunliffe, 14 bls.; Amtorg Trad-

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And provision for the future, maintenance of vast reserve resources, reduces emergencies to a minimum.

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BRANDON 3-PLY "TRI-UMPH" AND STANDARD WARP

Deckle Tape and Cutter Webbing—Cotton and Rubber Belting—Enamelled, or Rubber, Fourdrinier Aprons—Rubber Splicing Tissue—Neutral Soap Powder—Dryer Felt Sewing Twine —Superheat Asbestos Packing—Rubber Sheet Packing—Steam and Water Hose "Lambeth" Cotton Transmission Rope

Technical Association Papers, Series VIII (1925)

In paper, 248 pages. $3 per copy

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- Evaporator Test Code for Soda Mills
- Preliminary Impregnation of Wood
- Strength Test for Chemical Pulp
- Sulphite Waste Liquor as Fuel
- Use of Decayed Wood for Bleached Chemical Pulp

MECHANICAL OPERATION
- Alexander Electric Paper Drier
- Burning of Wood Refuse
- Moisture Meter and Its Use in Water Removal
- Ruths' Steam Accumulator
- Steam Prime Movers for Paper Mills
- Ventilation of Paper Machine Rooms

MECHANICAL PULP
- Norton's Segmental Pulpstone
- Refiners for Groundwood Tailings

PAPER TESTING
- Bureau of Standards and the Weller Brittleness Test
- Extractor and Cleaner for Carbon Paper
- Pulp Weight Factors for Microscopical Analysis
- Relation of Paper Furnish to Paper Tests
- Stains for Microscopical Analysis
- Study of the Mullen Tester
- Test for the Liquid Permeability of Paper
- Tests at Various Relative Humidities
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- Burning of Wood Refuse
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- Uses of Carbon Recovered from Black Ash
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- White Water Utilization Code

MISCELLANEOUS
- Baryta Paper
- Bibliography of Paper Making for 1924
- Effect of Acetic Acid on Animal Glue
- Notes on China Clay
- Reference Library
- Standard Method for Testing Bags
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For EVERY GRADE of PULP & PAPER

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Seamless felts for fast running.
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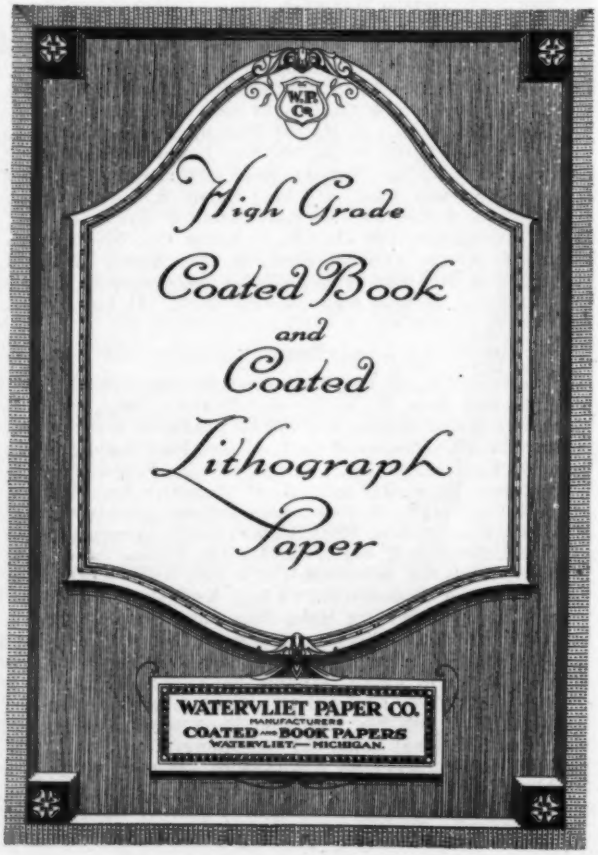

ing Co., 171 bls.; Brown Bros. & Co., 696 bls.; C. R. Spence & Co., 13 bls.; A. W. Fenton, Inc., 1,391 bls.; Amsinck, Sonne & Co., 170 bls.; Strupp & Co., 88 bls.; Goldman, Sachs & Co., 52 bls.; W. Schall & Co., 37 bls.; McKenzie & Co., 10 bls.; Order, 1,951 bls.

Miscellaneous Paper Stock

Whaling Waste Products Co., 230 bls.; J. Cohen & Co., 50 bls.; Brown Bros. & Co., 159 bls.; Maurice O'Meara Co., 389 bls.; Equitable Trust Co., 345 bls.; Milton Snedeker Corp., 111 bls.; Irving Bank-Columbia Trust Co., 681 bls.; Anglo-South American Trust Co., 1,374 bls.; Central National Bank, 53 bls.; American Exchange-Pacific National Bank, 86 bls.; Darmstadt, Scott & Courtney, 5 bls.; Ohio National Bank, 250 bls.; Salomon Bros. & Co., 74 bls.; Girard National Bank of Philadelphia, 20 bls.; Amsinck, Sonne & Co., 71 bls.; Weil Bros., 53 bls.; Order, 626 bls.

Paper

Imports of paper and board into the United States showed a rise in value during March, the total reaching $12,008,663, an increase of 15 per cent over the total for February last, according to Department of Commerce figures. Imports of standard newsprint again registered a gain, March imports amounting to 141,424 tons (of 2,240 pounds), valued at $10,-687,801, compared with 118,946 tons in February last, and 114,213 tons in March, 1925. Increased amounts of grease-proof, writing, surface-coated and hanging papers and paper boxes were also received in March in comparison with last year, while considerable reductions occurred in receipts of book, kraft wrapping and tissue papers.

Paper imports during May, 1926, continued on a fairly heavy scale, judging from unofficial figures compiled from manifests of steamers reaching the port of New York in that month. Less wrapping paper was received, but newsprint shipments were moderately large, as were those of cigarette, filter, hanging and other papers. A feature of the May imports was the big shipments of straw board, chiefly from Holland and Sweden.

Imports of paper of all kinds through the port of New York during April follow, these data being taken from manifests of vessels arriving at that port during the month:

Printing

B. F. Drakenfeld & Co., 51 cs. from Liverpool; F. C. Strype, 22 cs. from Liverpool; P. Puttmann, 143 cs. from Antwerp; Maurice O'Meara Co., 187 bls. from Hango; Irving Bank-Columbia Trust Co., 339 bls. from Hamburg; H. Reeve Angel & Co., 120 bls., 425 rolls and 29 cs. from Bremen; P. C. Zuhlke, 185 cs. from Antwerp; H. Glass & Co., 7 cs. from Antwerp; J. Henschel & Co., 10 cs. from Hamburg; Titan Shipping Co., 23 cs. from Havre; Perkins-Goodwin Co., 130 cs. from Hamburg and 87 rolls Rotterdam; E. Dietzgen & Co., 7 cs. from Hamburg; J. P. Heffernan Paper Co., 8 bls. from Hamburg and 26 bls. Rotterdam; Keuffel & Esser Co., 149 rolls from Hamburg; Parsons & Whittemore, 348 rolls from Hamburg; International Forwarding Co., 24 cs. from Antwerp; Martin & Bechtold, 6 cs. from Bremen; C. Steiner, 6 cs. from Rotterdam; American Express Co., 24 rolls and 5 bls. from Anto Domingo; Oxford University Press, 7 cs. from Liverpool; Hudson Trading Co., 10 reels from Hamburg; W. Hartmann & Co., 26 bls. from Hamburg; Order, 2,913 reels and 545 cs. from Hango, and 372 rolls from Bremen.

Wrapping

M. M. Cohen, 108 rolls and 117 bls. from Gothenburg; United Hardware & Tool Corp., 3 cs. from Hamburg; C. Steiner, 19 cs. from Hamburg; Wilkinson Bros. & Co., 168 rolls and 11 bls. from Gothenburg and 15 bls. Hamburg; Arkell Safety Bag Co., 682 rolls and 33 bls. from Gothenburg; Okonite Callendar Cable Co., 120 rolls from London; E. Dietzgen & Co., 18 cs. from Rotterdam; Blauvelt-Wiley Paper Mfg. Co., 140 bls. from Glasgow; F. C. Strype, 33 cs. from Antwerp; Gallagher & Ascher, 3 cs. from London; Irving Bank-Columbia Trust Co., 7 bls. from Hamburg; Steffens, Jones & Co., 5 cs. from Rotterdam; C. G. Winans Co., 592 rolls and 22 bls. from Gothenburg; Borregaard Co., 523 bls. and 894 rolls from Gothenburg; C. K. MacAlpine & Co., 80 reels from Gothenburg; J. P. Heffernan Paper Co., 11 bls. from Rotterdam and 48 bls. Gothen-

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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

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80 YEARS'—

Experience in Making Dryer Felts

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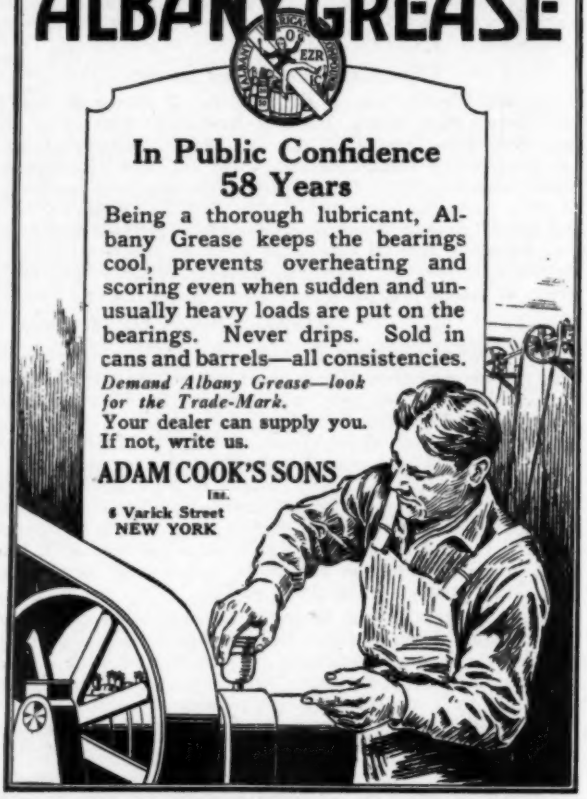

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THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

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CANTON, MASS.

Woolen Manufacturers Since 1856

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L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

burg; Hensel, Bruckman & Lorbacher, 11 cs. from Rotterdam; Rohner, Gehrig & Co., 11 cs. from Hamburg; Order, 117 bls. from Antwerp.

Cigarette

Standard Products Corp., 338 cs. from Havre; British-American Tobacco Co., 5 cs. from Liverpool and 50 cs. Havre; American Tobacco Co., 1,150 cs. from Bordeaux; M. Spiegel & Sons, 20 bls. from Genoa and 11 cs. Bordeaux; Southern Pacific Co., 3 cs. from Havre; Bank of the Manhattan Co., 30 cs. from Lisbon; P. J. Schweitzer, 122 cs. from Marseilles; J. C. Murray & Co., 4 cs. from Barcelona.

Writing

Guibont Freres & Co., 22 cs. from Southampton and 28 cs. Havre; E. Dietzgen & Co., 41 cs. from Marseilles; Chase National Bank, 3 cs. from Southampton.

Drawing

H. Reeve Angel & Co., 4 cs. from London and 8 cs. Southampton; E. Dietzgen & Co., 6 cs. from Hamburg; Keuffel & Esser Co., 6 cs. from London, 39 cs. Hamburg and 41 cs. Rotterdam; Order, 15 cs. from Hamburg.

Filter

A. Giese & Son, 21 bls. from Bordeaux; H. Reeve Angel & Co., 9 cs. from London, 48 cs. Bordeaux and 16 cs. Southampton; E. Fougera & Co., 83 cs. from Southampton; C. Schleicher & Schull, 10 cs. from Hamburg; J. Manheimer, 78 bls. from Bordeaux; Taiyo Trading Co., 3 cs. from Nagoya; National City Bank, 84 cs. from Southampton.

Tissue

Baldwin Universal Co., 4 cs. from Liverpool; F. C. Strype, 3 cs. from Liverpool; S. Gilbert, 4 cs. from Rotterdam; J. B. Mast & Co., 6 cs. from Genoa; Columbia Ribbon & Carbon Mfg. Co., 7 cs. from Hango; Milton Snedeker Corp., 12 cs. from Hamburg; Iwai & Co., 4 cs. from Kobe; Order, 4 cs. from Palermos.

Photo

J. J. Gavin & Co., 4 cs. from Liverpool; Globe Shipping Co., 541 cs. from Bremen; P. Puttmann, 192 cs. from Antwerp; Gevaert Co. of America, 213 cs. from Antwerp and 20 cs. Rotterdam; P. C. Zuhlke, 177 cs. from Antwerp and 78 cs. Rotterdam; G. Murphy, Inc., 24 cs. from Southampton; Phoenix Shipping Co., 49 cs. from Hamburg; Order, 120 cs. from Antwerp.

Hanging

A. C. Dodman, Jr., Inc., 4 bls. from Southampton, 21 bls. Liverpool and 40 bls. Antwerp; F. J. Emmerich & Co., 5 bls. from Hamburg, 7 bls. London and 6 bls. Southampton; C. A. Haynes & Co., 29 bls. from London, 3 bls. Liverpool and 36 bls. Southampton; W. H. S. Lloyd & Co., 9 pks. from Liverpool; J. E. Bernard & Co., 4 bls. from Hamburg and 3 cs. Gothenburg; G. J. Hunken & Co., 4 bls. from Hamburg; Janeway & Carpenter, 259 bls. from Antwerp; Panama-Pacific Line, 14 pks. from Southampton; Order, 130 reels from Hango.

Board

Houbigant, Inc., 15 cs. from Southampton; Adrian Vuyck, 2,028 rolls from Rotterdam; State Bank, 644 rolls from Rotterdam; Bendis Paper Co., 87 cs. from Hamburg; Metropolitan Import & Mfg. Co., 194 cs. from Hamburg; Hensel, Bruckman & Lorbacher, 10 cs. from Hamburg and 5 cs. Rotterdam; J. J. Shore & Co., 13 cs. from Havre; J. P. Heffernan Paper Co., 449 pks. from Rotterdam; Fiber Case & Novelty Co., 177 bls. from Gothenburg; M. Meyerson, 71 bls. from Gothenburg; Happel & McAvoy, 3 cs. from Havre; Thompson & Norris Co., 332 reels from Rotterdam; Haas & Bros., 10 bls. from Rotterdam; Spaulding & Tewksbury Co., 79 reels and 45 cs. from Rotterdam; American Express Co., 68 bls. from Hamburg; O. M. Baxter, Inc., 44 cs. from Gothenburg; Wilkinson Bros. & Co., 22 rolls from Gothenburg; A. B. Massa Paper Co., 1,003 pkgs. from Rotterdam; Order, 427 reels from Rotterdam.

Miscellaneous

Titan Shipping Co., 20 cs. from Southampton and 19 cs. Havre; International Forwarding Co., 24 cs. from Hamburg

Starch

ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

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Starch

The Rosin for Waterproofing

IT HAS been established beyond all doubt that Hercules Wood Rosin imparts unexcelled waterproofing properties to paper size. Write us for information. Our Service Department will be glad to give you any assistance possible.

See page 481 in the 1925 Paper and Pulp Mill Catalogue

HERCULES POWDER COMPANY
(INCORPORATED)
941 Market Street, Wilmington, Delaware

Sales Offices:

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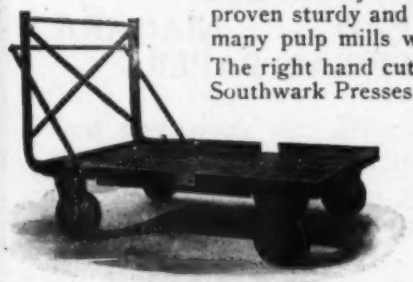
SOUTHWARK HYDRAULIC PRESSES

for Pulp, Sulphite, Baling, Etc.

HYDRAULIC PUMPS, VALVES, FITTINGS, SHOCK ABSORBERS, PULP TRUCKS, ETC.



Southwark Pulp Truck, for Use with Presses Shown at the Right. Saves Time and Labor

Southwark Hydraulic Presses for dehydrating pulp have proven sturdy and efficient machines in every one of the many pulp mills where we have installed them.

The right hand cut shows an installation of four 600-ton Southwark Presses in a large pulp and paper mill. These presses are designed for use with Southwark Pulp Trucks, the trucks are loaded and run under the press, the pulp being compressed directly on the truck.

This feature gives fast operation, saves labor and eliminates curbs, boxes or other containers on the press.

Four 600-Ton Southwark Pulp Presses, Minnesota & Ontario Paper Co., International Falls, Minn.

SOUTHWARK FOUNDRY AND MACHINE CO.

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CHICAGO
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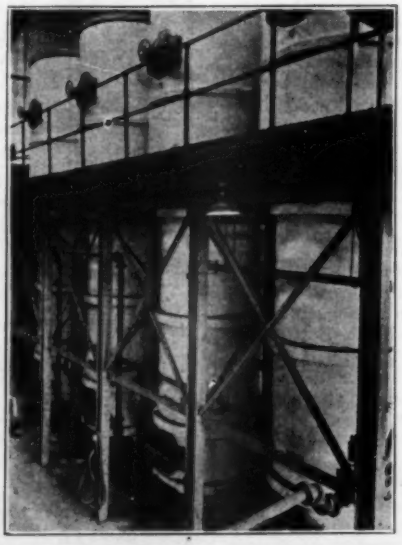
IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
NORTHWEST
PAPER CO.
Cloquet, Minn.



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MAXIMUM
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NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 316 in the 1925 Paper and Pulp Mill Catalogue

and 10 cs. Rotterdam; F. C. Strype, 182 cs. from Hamburg; Bernard, Judae & Co., 7 cs. from Gothenburg; Hansel, Bruskman & Lorbacher, 3 cs. from Bremen; Japan Paper Co., 24 cs. from Rotterdam, 6 cs. Bordeaux, 65 cs. Havre and 84 cs. Genoa; Heemsoth, Basse & Co., 17 cs. from Hamburg and 48 pkgs. Rotterdam; Whiting-Patterson Co., 51 cs. from Southampton; Guaranty Trust Co., 112 cs. from Hamburg; C. W. Williams & Co., 44 cs. from Antwerp; General Electric Co., 20 cs. from Genoa; C. G. Euler, 25 bls. from Bordeaux; R. F. Downing & Co., 5 cs. from Havre; P. H. Petry & Co., 9 pkgs. from Havre and 17 cs. Rotterdam; C. H. Boulin, 30 cs. from Havre; F. L. Kraemer & Co., 31 cs. from Bremen; Coenca-Morrison Co., 21 cs. from Havre and 4 cs. Hamurg; J. & H. Berge, 6 cs. from Bristol; International Acceptance Bank, 35 cs. from Rotterdam; Perry, Ryer & Co., 80 cs. from Glasgow; Royal Danish Legation, 3 cs. from Oslo; National Shawmut Bank, 101 bls. from Shanghai; Globe Shipping Co., 6 cs. from Rotterdam; Judson Freight Forwarding Co., 17 cs. from Bremen; Phoenix Shipping Co., 3 cs. from Bremen; R. Reiner, Inc., 5 cs. from Kobe; Quality Art Novelty Co., 10 cs. from Havre and 6 bls. Hamburg; S. Gilbert, 11 cs. from Rotterdam; Borden & Riley Paper Co., 6 cs. from Antwerp.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 20149—Newsprint paper and other paper. London, England. Agency desired.

No. 20147—Stationery. Fuerth, Germany. Purchase and agency desired.

No. 20098—Wrapping paper, glassine paper, and paper sacks. Sydney, Australia. Agency desired.

No. 20215—Cigarette cartons, waxed-paper lined and printed. Tegucigalpa, Honduras. Purchase desired.

No. 20348—Papermaking machinery for newsprint, book, writing and other paper, and pulp wood preparing machinery. Teheran, Persia. Purchase desired.

No. 20317—Newsprint paper, low quality. Batavia, Java. Purchase desired.

No. 20318—Typewriter paper. Casablanca, Morocco. Purchase and agency desired.

No. 20454—Paper bags for flour and cement. Santiago, Cuba. Agency desired.

No. 20466—Overissued newspapers. Amritsar, India. Purchase and agency desired.

No. 20469—Paper and stationery. Nuremberg, Germany. Agency desired.

No. 20473—Paper and stationery. Shanghai, China. Agency desired.

Freight Not Deductible from Tariff

A decision of the utmost importance to the entire American paper industry has been handed down by the United States Court of Customs Appeals, the customs court of last resort. According to this decision, inland freight on German paper from the mill to the port of export can not be deducted from the dutiable value of the paper.

In general it may be stated that importations up to this time have been made with a reduction of seldom less than 10 percent of the value of the paper for inland freight in Germany. In some cases the freight deductions claimed have been as high as 28 percent.

The importance of the decision to the American paper industry is demonstrated by the fact that there are approximately 150 paper cases now docketed for trial before the Board of General Appraisers involving inland freight as one of the points at issue. The decision will affect all of these pending cases as well as all future importations of German paper. Practically every grade of German paper exported to the United States is affected, but in particular the decision applies to wrapping papers, both kraft and sulphite, printing and M. G. sulphite papers. The principle involved will also apply to importations from other countries which sell paper upon the same basis as German sales.

MITTS & MERRILL

The Mitts & Merrill Shredder will reduce magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock in a thoroughly economical manner.

Built in sizes with spouts ranging from 18 to 45 inches wide.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

MITTS & MERRILL
1013 Tilden St.
Saginaw, Mich.

Fed by GRAVITY

or

CONVEYOR

See Pages 378 and 379 in the Paper and Pulp Mill Catalog

Longcrimp Fourdrinier Wires

USED EXTENSIVELY ON
Kraft, Wrapping and Newsprint Machines

Give Longer Average Service than the Regular Weave

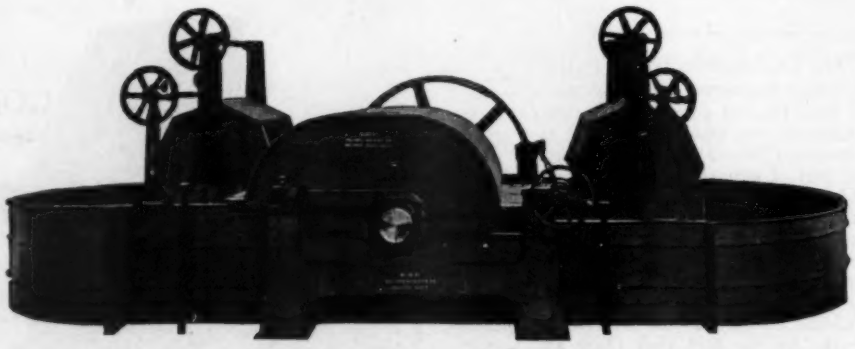
Made By

The Lindsay Wire Weaving Company
(Collinwood Station) CLEVELAND, OHIO

See page 378 in the 1925 Paper and Pulp Mill Catalogue

Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills



Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.